

Human Factors that Promote Successful Puppy Raising

by

Dac Loc Mai

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School of Psychology and Public Health

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Victoria, Australia

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List of Abbreviations

3T – Triple Triangle

AD – Assistance dog

BCW – Behaviour Change Wheel

COM-B – Capability, Opportunity, Motivation, and Behaviour

PR – Puppy raising

List of Publications

Chapter 2

Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2021a). Beyond puppy selection—considering the role of puppy raisers in bringing out the best in assistance dog puppies. *Journal of Veterinary Behavior*, 42, 1-10.
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Chapter 3

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Chapter 4

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Chapter 5

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List of Conference Presentations and Industry Research Report

Related to this Thesis

2021

Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2021, June 22-24). *Assistance Dog Puppy Behaviour: The Influences of Puppy Training and Socialisation Provided by Puppy Raisers, and Organisational Support* [Conference presentation]. 30th International Society for Anthrozoology Conference (Virtual). <https://www.isaz2021.net>

2020

Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2020, March 30). *Puppy raisers' practices and perceived supports—quantitative analyses of online survey data, and recommendations*. Internal Guide Dog Foundation report: unpublished.

2019

Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2019, September 1-6). *What helps and what hinders assistance dog puppy-raising practices?* [Conference presentation]. International Working Dog Conference 2019, Stockholm, Sweden.
https://www.iwdba.org/wp-content/uploads/2019/12/d-l-mai_presentation.pdf

Non-Related to this Thesis

2018

Mai, D. Bennett, P. (2018, July 2-5). *Does pet ownership affect how well Vietnamese people adjust to living in Australia?* [Conference presentation]. 27th International ISAZ Conference, Sydney, Australia. <http://www.isaz.net/isaz/wp-content/uploads/2018/08/ISAZ2018-Abstract-Book.pdf>

Abstract

Puppy raising (PR) programs recruit volunteers from community members (raisers) to raise assistance dog (AD) candidates from puppies until the dogs are ready for advanced training. Once qualified, the ADs can assist human handlers with a disability to live more independently. Unfortunately, about 50% of all puppies may not meet the high behavioural standards required for further training after the PR program. This increases costs and lengthens the time taken for a handler to obtain an AD. High failure rates persist despite efforts from AD organisations to improve their puppy selection and training models. Perhaps these organisational changes do not translate into changes in the everyday practices of the puppy raisers, who manage their puppy's learning and early experiences. Little is known about the nature of, and how to promote, raisers' best practices. This thesis aimed to understand the characteristics of successful PR, conceptualised as a process achieving favourable puppy behaviour, as perceived by raisers, and optimal raiser satisfaction. A mixed-methods research model was designed with three studies, two of which aimed to explore factors affecting raisers' PR practices and to quantitatively examine relationships between these factors and perceived puppy behaviour. The third study explored facilitators and barriers to raisers' engagement in recommended PR practices. The qualitative findings suggest potential influences on raisers' experiences and practices, including various types of support, raiser-specific factors, and perceived puppy behaviour. The quantitative results are the first to establish influences of raisers' socialisation and training practices on raisers' perceived puppy behaviour. This thesis, therefore, opens up a new direction for future research and suggests a raiser-centred approach to improving program outcomes for both the raisers and their puppies. The findings will allow future research to employ more objective measures and experimental designs to corroborate these findings and further extend knowledge in this developing field.

Statement of Authorship

Except where reference is made in the text of the thesis, this thesis contains no other material published elsewhere or extracted in whole or in part from a thesis accepted for the award of any other degree or diploma. No other person's work has been used without due acknowledgement in the main text of the thesis. This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution. All research procedures reported in this thesis were approved by the SHE College Human Ethics Sub-Committee (HEC18381), the SHE Low Risk Human Ethics Committee (HEC19031), the University Human Ethics Committee (HEC18325), and the Animal Ethics Committee (AEC18043).

Dac Loc Mai

4th September 2021

Declaration for Thesis Based or Partially Based on Conjointly Published Work

This thesis contains four (4) co-authored manuscripts published in peer-reviewed journals as described in the text. The candidate was primarily responsible for selection of the theoretical framework, study design, management of data collection, data analysis, and writing of the manuscripts under the supervision of Professor Pauleen Bennett, Dr Tiffani Howell, and Dr Pree Benton. The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

The undersigned hereby certify that:

1. The below declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors;
2. They meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
3. They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
4. There are no other authors of the publication according to these criteria; and
5. Potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit.

Thesis chapter	Publication title	Status	Author contributions
2	Beyond puppy selection—considering the role of puppy raisers in bringing out the best in assistance dog puppies	Published	Mai (70%): Concept, reviewing literature, key ideas, writing first draft. Howell (10%); Benton (10%); Bennett (10%)
3	Raising an assistance dog puppy - stakeholder perspectives on what helps and what hinders	Published	Mai (70%): Concept, data collection, data analyses, writing first draft. Howell (10%); Benton (10%); Bennett (10%)
4	Socialisation, training, and help-seeking—specific puppy raising practices that predict desirable behaviours in trainee assistance dog puppies	Published	Mai (70%): Concept, data collection, data analyses, writing first draft. Howell (10%); Benton (10%); Bennett (10%)
5	Facilitators and barriers to raisers' engagement in recommended assistance dog puppy raising practices	Published	Mai (70%): Concept, data collection, data analyses, writing first draft. Howell (8%); Benton (8%); Lewis (3%); Evans (3%); Bennett (8%).
Name		Date	
Dac Loc Mai		1 st July 2021	
Pauleen Bennett		5 th July 2021	
Tiffani Howell		5 th July 2021	
Pree Benton		5 th July 2021	
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One day-long trip brings a basket-full of wisdom.
- Vietnamese proverb -

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Chapter 1:

Introduction and Thesis Structure

The Assistance Dog Industry

Individuals with a disability may require assistance from others in their daily living, which may hinder their ability to lead an independent life. Assistance dogs (AD) appear as a viable alternative to human support for some assistance roles, such that the individual AD handler could enjoy a more independent life (ADI, 2019; Bremhorst et al., 2018).

Unfortunately, demand for ADs is so high that people with disability who register their interest and are assessed by an AD provider as suitable to have an AD often have to wait months or even years before a suitable AD is available for them.

In an attempt to better meet the high demand, the AD industry has invested greatly in selective puppy breeding (Goddard & Beilharz, 1982). Once selected puppies are weaned, many providers place them into a puppy raising (PR) program (Asher et al., 2017; Batt et al., 2010). Volunteer raisers are recruited to foster a puppy for about a year, from weaning until about 16 months of age (Batt et al., 2010; Cooke & Farrington, 2016; Lahman, 2018). At the end of the PR program, only healthy dogs with suitable behavioural traits advance to the next stage of specialised training, also known as advanced training (e.g., Asher et al., 2017). The AD candidates then need to pass final qualification assessments to become fully-fledged ADs.

This rigorous training and selection process ensures that ADs are physically capable of providing disability support, can perform disability-specific tasks to support their handler, and have behaviour suitable to access public spaces which are off-limits to pet dogs (Americans with Disabilities Act, 2017; Bremhorst et al., 2018; Disability Discrimination Act, 2011). However, raising AD puppies to these high standards is expensive and difficult, with a large proportion of commencing puppies (40%) being eliminated at the end of PR programs (Dollion et al., 2019). It is unclear why so few of the carefully selected puppies make the grade, but behavioural traits, rather than health defects, are a common problem.

Problems

Puppy Behaviour—A Long-Standing Unsolved PR Puzzle

As puppies grow up, they may exhibit behaviours that once allowed their ancestors to survive in the wilderness (e.g., hunting, chasing, and escaping when fearful) and traits that have been selected during their domestication for companionship (e.g., friendliness and strong attachment to humans), or behaviours for working purposes (e.g., resource guarding, hunting, and retrieving). While such behaviours are species-typical, exhibiting them inappropriately (e.g., barking or being overly affectionate and pulling towards strangers in public) may render dogs unsuitable for assistance roles.

Dollion et al. (2019) reported that only 6.5% of dogs that were assigned to an advanced training program failed at their final graduation assessment. This low failure rate following the advanced training stage could be due to: the elimination of unsuitable puppies at the end of the PR program; better management and training for the dogs during advanced training, which qualified dog trainers usually carry out; greater stability in behaviour and temperament of the adult dogs (Fratkin et al., 2013). Regardless, the observation that most dogs fail at the end of the PR program confirms the importance of managing puppies' learning and early experiences during this life stage.

This is understandable given that, during the puppy raising program, puppies go through several developmental stages, periods during which experiences can have long-lasting effects on their adult behaviour (Serpell et al., 2016). The stages of puppy development were initially described by Scott (1963) and have been revised in modern literature. For example, Serpell et al. (2016) proposed six stages of puppy development, adding the prenatal (the first) and pubertal (the last) stages to Scott's (1963) four stage model. The six stages include prenatal, neonatal (0-6 days), transition (2-3 weeks), socialisation (3-12 weeks), juvenile (12 weeks to 6 months), and pubertal (after 6 months until sexual

maturation at 12 to 24 months depending on breed). Research using rat models found genetic-independent long-term effects of maternal stress hormones during the prenatal stage on their offspring's sensitive responses to stressors in adulthood (Champagne, 2008). The neonatal and transition periods see puppies developing their sensory (e.g., visual and auditory) and basic behavioural patterns (e.g., reflexes, distress call and tail wagging, Serpell et al., 2016). Influences during these three stages depend on the management of experienced breeders or an in-house puppy breeding program at each AD organisation.

Puppies then typically move to a new house with their puppy raisers between the age of 6 and 12 weeks (Asher et al., 2013; Batt et al., 2010), which means the latter part of their socialisation period and the entirety of their juvenile and pubertal periods are managed by the puppy raisers. Socialisation (3-12 weeks) is a sensitive period during which puppies become familiar with social (e.g., humans, other dogs, and other animals) and non-social (e.g., household items and traffic) stimuli. Puppies with poorly managed exposure to everyday situations before turning 12 weeks of age tend to develop fearful responses to those stimuli (Rooney et al., 2016; Serpell et al., 2016). The neurosensory mechanism underlying this process is discussed in-depth in Chapter 2.

Puppies enrolled in a PR program are typically assessed for suitability during the socialisation stage (around 6 to 12 weeks). However, to maintain and consolidate the desired traits observed during this initial assessment, puppies require regular top-up socialisation experiences and gradual introduction to new age-appropriate situations during the juvenile period (Rooney et al., 2016). Once puppies enter the puberty stage (from 6 months until sexual maturity), regular, intensive socialisation becomes less crucial to sustaining those well-developed traits (Fox, 1987; Woolpy & Ginsburg, 1967). Behaviours and traits at this last stage become more predictive of their adult behaviours (Serpell & Duffy, 2016).

Although the latter three developmental periods are sensitive stages for development and consolidation of puppies' desirable behaviours, the influences of factors in these stages on their long-term behaviour have been under researched. With the combined costs of breeding and raising a guide dog puppy until they leave their raiser being about 6,700 GBP (approximately 12,100 AUD, 7,800 EUR, or 9,500 USD; GDBA, 2010, as cited in Asher et al., 2013), failed puppies are a waste of investment for the training organisations, and a waste of the time commitment and efforts of the volunteer raisers. It is perhaps surprising then, that nurture effects on puppies' behavioural development, particularly factors occurring during the PR process, have remained largely overlooked in the AD literature.

Puppy Raisers—The Missing Piece of the Puzzle?

Research in the AD literature has primarily focused on puppy outcomes as a measure of success of PR programs. However, a successful and sustainable PR program also requires that the volunteers who raise the puppies find the experience rewarding – thereby either volunteering to raise an additional puppy or recommending the experience to others. Chur-Hansen et al. (2015) were the first to focus on raisers' experiences, interviewing nine first time raisers at four time-points: before they received the puppy, then at one week, three months, and 13 months into the program. The raisers reported various difficulties associated with managing their puppies' behaviour (e.g., chewing household items, crying at night, and entering restricted areas), and described negative social and psychological effects of the PR process on their lives. The negative experiences were recurring across all three progress interviews, were commonly shared amongst the raisers, and were largely attributable to the perceived inadequacy of organisational support.

From a phenomenological standpoint, these findings raise an ethical concern over the lack of adequate support from some organisations for their volunteer raisers, who dedicate a year of effort and personal sacrifice for a good cause. More immediately, however, the results

suggest that volunteer raisers in programs with sufficient support may have more positive experiences, thereby ensuring sustainability of the program and also, potentially, improving outcomes for the puppies they raise. Puppy raisers are highly motivated to raise successful puppies who then help handlers with a disability (Chur-Hansen et al., 2015) and they provide primary care and teach foundational house and public manners to puppies. Well-supported raisers may be in a better position to engage in practices that meet the training needs of their puppy and may also consider raising subsequent puppies for their organisation. Questions that remain unanswered, however, are ‘*What practices do puppy raisers engage in?*’, ‘*What support do raisers need?*’ and ‘*How much support is sufficient?*’. And further, ‘*Should AD organisations consider extending their concerns beyond puppy training progress to include raisers’ program engagement and satisfaction?*’

Both the AD industry’s interest in further understanding factors that would improve puppy behaviour and the ethical concerns surrounding the provision of support to improve raiser practices merit further research. Understanding factors affecting puppy behaviour and raiser practices during a PR program would inform the AD industry of how to promote success in these two aspects of PR.

Aim and Scope of the Thesis

Aim and Research Questions

This thesis aimed to understand the characteristics of successful puppy raising by addressing two research questions:

***Q1:** What are the predictors of puppy behaviour during a PR program, as perceived by puppy raisers?*

***Q2:** What are the facilitators and barriers to raisers’ engagement in recommended PR practices?*

The focus of Q1 was on outcomes for puppies during a PR program, while Q2 was concerned with raisers' practices. Because raisers are responsible for many of the early experiences of puppies, a hypothesis was proposed to partially link Q1 with Q2. It was hypothesised that (H_1) raisers' practices would be a predictor of puppy behaviour.

If H_1 was supported, Q2 would become a contingency question to Q1. In other words, if the raisers' practices predicted their puppy's behaviour, understanding facilitators and barriers in Q2 would help directly improve raisers' practices and indirectly improve the puppies' behaviour—the outcomes in Q1. However, if the null hypothesis (H_0) was supported (i.e., raiser practices were not a predictor of puppy behaviour), Q2 would remain as an independent research question exploring raiser-specific factors – an important aspect of successful PR programs which has been largely overlooked in the AD literature to date.

Q1 was addressed by exploring factors promoting successful PR programs, followed by a quantitative examination of the influences of those factors on puppy behaviour. Answering Q2 involved identifying recommended PR practices and exploring factors relevant to those recommendations.

Scope

The scope of this thesis was limited to factors contributing, either directly or indirectly, to puppy behaviour and raisers' practices during the PR period. Therefore, this thesis was not concerned with factors occurring before the PR period, such as puppy breeding or puppy selection programs. Although careful breeding and selection offer many potential benefits, such as puppies being less aggressive, less distracted, and more friendly to begin with (Goddard & Beilharz, 1982; Vaterlaws-Whiteside & Hartmann, 2017), those programs' activities have already received much research attention (e.g., Asher et al., 2013; Goddard & Beilharz, 1982; Takeuchi et al., 2009; Vaterlaws-Whiteside & Hartmann, 2017) and were beyond the scope of this thesis.

Additionally, unlike most research in the AD literature (e.g., Batt et al., 2008; Vaterlaws-Whiteside & Hartmann, 2017), this thesis did not consider the puppy's final graduation success as an outcome. The focus was strictly on factors occurring during the PR period and how they influenced the puppies' behaviour during this time. This decision was made to eliminate any extraneous variables occurring during the advanced training stage, which may benefit at-risk dogs, enhance the high-quality ones, or potentially negatively affect good ones, representing a confound with the PR program.

Previous research on animal behaviour has extensively used objective measures of puppy behaviour, such as behavioural coding from videotapes, independent and trained raters, or collecting frequency data on puppy behaviour. Rather than taking this approach, in this thesis puppy behaviour was operationalised by raiser reports. This ensured the thesis was manageable and also meant that the approach was more holistic, combining both the puppies' and the raisers' outcomes. It was felt that, while puppy behaviour can be measured objectively, raiser perceptions of the behaviours may be more important in terms of determining outcomes for both the raiser and potentially indicating their puppy's training progress.

In short, this thesis was concerned with variables relevant from the moment puppies are placed with raisers until they leave for either advanced training, a career change, or to be rehomed as companion dogs.

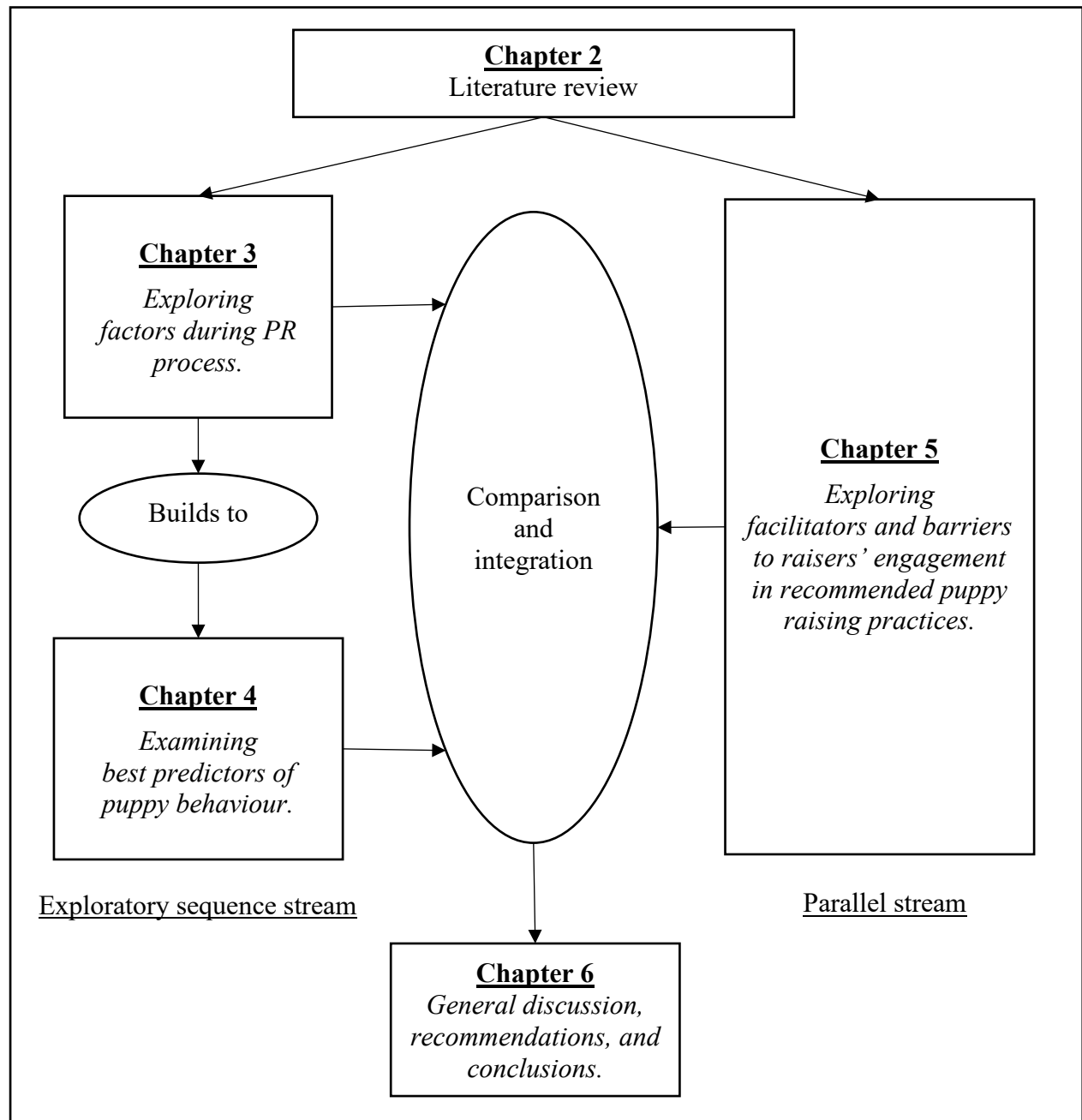
Overview of the Thesis

There are six chapters in this thesis. The current chapter has introduced the problems identified in the AD industry, the aim and the questions, the scope, and the structure of the remainder of the thesis. Chapters 2 through 5 present four published papers corresponding to the components of a mixed-methods research model developed for the project (see Figure 1.1). A parallel design was used, in which studies of two streams were conducted

concurrently, with findings being compared and integrated to reach a conclusion (Creswell & Plano Clark, 2011).

Figure 1.1

Combined Convergent Parallel and Exploratory Sequential Mixed-Methods Design



The literature review (Chapter 2) provided a framework that informed the development and design of the three studies in the model. Specifically, Chapter 2 presents a published critical literature review titled 'Beyond puppy selection—considering the role of

puppy raisers in bringing out the best in assistance dog puppies.’ This paper proposes a general PR model explaining potential relationships between various nature and nurture factors while centring on puppy behaviour. The chapter then discusses the PR processes using relevant Family Dynamics frameworks to highlight the roles of different types and functions of support during PR practices. The discussion of both the puppies’ and the raisers’ program outcomes guided the approach and development of the studies presented in the following chapters.

The first stream shown in Figure 1.1, was a sequence in which results of a qualitative study exploring factors affecting the PR process (Chapter 3), informed the design and data analysis of a quantitative study examining predictiveness of puppy behaviour from various PR factors (Chapter 4). This sequence by itself is a standard mixed-methods model, regarded as an exploratory sequential design (Creswell & Plano Clark, 2011). In this thesis, it was integrated as one stream in an overall convergent parallel design.

Chapter 3 presents a study titled ‘Raising an assistance dog puppy—stakeholder perspectives on what helps and what hinders’, which aimed to explore factors affecting raisers’ practices during the PR process. A total of 17 experienced puppy raisers and AD organisation staff participated in this study and shared what they perceived as helpful or hindering to PR. In addition to puppies’ inherent characteristics (e.g., temperament), the participants believed that several social and individual raiser factors would be relevant to promoting desirable PR experiences for raisers and potentially beneficial to puppies’ behavioural development. A list of candidate factors (e.g., various types and sources of support, raisers’ competency, perseverance and passion, and their help-seeking behaviour) emerged from this study and were later quantitatively tested for their predictiveness of perceived puppy behaviour in Chapter 4.

Chapter 4 presents a paper titled ‘Socialisation, training, and help-seeking—specific puppy raising practices that predict desirable behaviours in trainee AD puppies.’ This study aimed to examine the best predictors of puppy behaviour, addressing the research question Q1 in this thesis. An online questionnaire was developed to measure the candidate factors identified in Chapter 3, including various support types, raisers’ practices, and perceived puppy behaviour. The results showed that two raiser practice variables, namely puppy socialisation and puppy training practices, consistently appeared in the models predicting puppy behaviour, except for stair anxiety. The predicting effects were prominent even after controlling for puppy age. Furthermore, apart from support from a puppy sitter, which appeared to reduce puppy excitability, none of the other organisational or external factors directly affected puppy behaviour. These findings answered research question Q1: impacts of raiser practices on puppy behaviour. Further analyses found that perceiving higher informal organisational support from other experienced raisers regarded as mentors was predictive of more favourable ratings on raiser practices, which partly answered research question Q2: facilitators and barriers to raiser engagement in recommended practices. Mediation analyses showed that raisers’ help-seeking behaviour mediated the effects of mentor support on raiser practices. This study concluded the exploratory stream and partly informed the focus for data analysis of the longitudinal study in the parallel stream.

A second stream of research completed the parallel model shown in Figure 1.1, with a longitudinal qualitative study exploring what facilitates or hinders raisers’ engagement in recommended practices. Chapter 5 presents a published study titled ‘Facilitators and barriers to assistance dog puppy raisers’ engagement in recommended raising practices.’ This study aimed to explore factors affecting raisers’ practices and was conducted simultaneously with the two studies in the exploratory stream. The findings in this study helped answer research question Q2. In this study, eight La Trobe University staff members or students, who

volunteered to raise puppies for an independent program provider, participated in semi-structured interviews at various time points: before their puppy's arrival, at the end of the first week, during monthly progress checks, and after returning their puppies. The raisers shared their experiences and elaborated on what facilitated or impeded different aspects of their PR.

In this study, even though the interview schedule was very broad, simply asking the raisers to describe their PR experiences since the previous interview, a theory-driven approach was adopted to focus the analysis on a specific theoretical foundation. Three recommended PR practices were found in the working dog literature and in the findings in Chapter 4; frequent puppy socialisation, consistent puppy training, and raisers' effective learning. Focusing on these practices helped narrow the thematic analysis to exploring facilitators and barriers to raisers' engagement in each of the three recommended PR practices. The identified factors were related to perceptions of puppy behaviour, raisers' ability and availability, program operation, and contextual factors naturally occurring within raisers' living and working environments.

Chapter 6 presents a general discussion of how the research findings presented in Chapters 3 through 5 helped answer the two research questions and achieve the overarching aim proposed in this thesis. Since the studies in the thesis adopted different methodologies (i.e., qualitative and quantitative), and designs (i.e., cross-sectional and longitudinal), this chapter also serves as a point of integration for the findings, a necessary component in mixed-methods research (Creswell & Plano Clark, 2011). Chapter 6 then discusses the potential for adopting a holistic approach to directly enhancing raiser-specific program outcomes, which is also hoped to improve puppy behaviour during the PR program. Specifically, the chapter briefly introduces the Behavioural Change Wheel (BCW, Michie et al., 2011), a robust behavioural framework to promote behaviour changes. The relevance of the BCW to the current findings is discussed, and a new model, the Triple Triangle (3T), presented. This

depicts a holistic class of actions corresponding to characteristics of successful PR as explored and corroborated in this thesis. After presenting the overall findings of the project and their implications, Chapter 6 discusses strengths and limitations of the research, and provides recommendations for the AD industry and future research, before concluding the thesis.

Chapter Summary

This chapter provided a very brief overview of the AD industry in general and its PR programs specifically. Some theoretical and practical issues emerged, which concern AD puppies' high behaviour-related failure rates at the end of their PR program and the negative impacts of insufficient organisational support on raisers' practices and their experiences. To begin to address these issues, the overarching aim of this thesis was to understand what characterises successful PR, defined in this thesis as achieving desirable puppy behaviour and optimal raisers' practices during the PR program. Two research questions were proposed to determine predictors of puppy behaviour during the PR program and explore factors affecting raiser practices. A mixed-methods model was described with four published studies embedded in the subsequent chapters, with the last chapter presenting a general discussion, implications, and conclusions.

Chapter 2:
Literature Review

Chapter Overview

Many AD organisations outsource puppy raising (PR) responsibility to volunteer raisers in a year-long PR program (Batt et al., 2010). To understand what roles these raisers play in PR, it is essential to review existing literature to understand how raiser factors have been studied and positioned within the AD literature. Thus, this chapter reviews existing AD research and discusses a potential framework to inform later research in this thesis.

The critical review presented in this chapter, titled ‘Beyond puppy selection—considering the role of puppy raisers in bringing out the best in assistance dog puppies’, was published in the *Journal of Veterinary Behavior*. The journal article adopted a General Systems Framework (Boulding, 1956; Von Bertalanffy, 1968) to review and organise existing research findings into three stages: input, throughput, and output, of a general PR process. Consequently, a general PR model was proposed, which illustrates multiple levels of factors (e.g., program-specific socialisation and training instructions, raiser socialisation and training practices) based on their interconnecting relationships with each other and with puppy behaviour. The model also emphasises a lack of understanding of raiser-specific factors and their influences on puppy behaviour during the PR process.

The section that follows the critical review provides further discussion on volunteer raisers’ practices. This section adopts relevant family concepts to explain the process of integrating puppies into the raisers’ family environment. By applying Family Dynamics theories to preliminary findings from the AD research, this section aimed to justify this thesis’s focus on understanding the nature and relevance of raisers’ practices in the PR process. The critical literature review and further discussion serve as contexts for the studies presented in Chapters 3 through 5.

Paper 1: Beyond Puppy Selection—Considering the Role of Puppy Raisers in Bringing out the Best in Assistance Dog Puppies

Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2021a). Beyond puppy selection—considering the role of puppy raisers in bringing out the best in assistance dog puppies. *Journal of Veterinary Behavior*, 42, 1-10.
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Further Discussion

The previous section presented a published critical review of the AD literature focusing on factors affecting puppy behaviour. The review adopted the General Systems framework (Boulding, 1956; Von Bertalanffy, 1968) to organise factors occurring during the PR process into three stages: input, throughout, and output. This approach resulted in a proposed general PR model (refer to Figure 2.1) in which puppies commencing a PR program with their baseline behavioural traits (input) are influenced by multi-level factors (i.e., at theoretical, organisational, and individual levels) during the PR program (throughput). As per this model, the input and throughput factors interact and jointly determine the puppies' behavioural training outcome at the end of the PR program (output).

This section shifts the focus of this chapter from puppies' behavioural outcomes to raisers' practices during the PR program (throughput). Chur-Hansen et al. (2015) reported several aspects of PR as having adverse effects on raisers' practices and their program experiences. These raiser-specific outcomes were reportedly attributable to the perceived inadequacy of organisational support from the relevant program provider. The general PR model somewhat echoes these findings when categorically proposing three raisers' PR practices at the individual level (i.e., training, socialising, and rearing practices) and their relationships with higher-order (organisational and theoretical) and lower-order (puppy training progress) levels. However, neither Chur-Hansen et al. (2015) nor the general PR model specifically describes the nature of the raisers' PR practices, or explains the dynamics of their relationships with the other factors during the PR program.

Therefore, to better understand how support may benefit raisers' PR practices, this section discusses the nature of the PR process and attempts to interpret the findings in Chur-Hansen et al. (2015) from a Family Dynamics perspective (Schermerhorn & Cummings, 2008), a well-established discipline (i.e., family processes) that greatly resembles PR. Later

in this thesis, several references will be made to the below discussion on potential applications of family theories to the PR process, to explain findings in subsequent research aiming to investigate the characteristics and functions of support to aid the PR process.

Understanding PR Processes from a Family Systems Perspective

Families can be perceived as systems, with members functioning as elements forming smaller and interdependent subsystems (Cox & Paley, 1997). Family members, via their mutual relationships, exert influences on each other (i.e., dyad), on the relationships of other family members (i.e., family-wide) and, at the same time, they are affected by those dyads and family-wide relationships (Schermerhorn & Cummings, 2008). Child Effects from the Transactional Family Dynamics model (Bell, 1968; Cummings & Schermerhorn, 2003; Schermerhorn & Cummings, 2008), for instance, confirm bidirectional relationships between children and their caregivers. These transactional processes suggest that, not only do children passively receive parenting, but their presence and their interaction patterns also influence their relationships with the parents and/or the relationship between their parents (Maccoby, 1984; Schermerhorn & Cummings, 2008).

Puppies and the Child Effects

In Chur-Hansen et al. (2015), raisers repeatedly reported myriad ways the puppies affected their lives and their families' dynamics. For instance, from the outset, raisers reported perceived potential benefits for themselves in their decision to raise a puppy, including to “increase family cohesion, allow spouses to function as a team, increase exercise through walking, and increase social interaction through activities related to the puppy” (Chur-Hansen et al., 2015, p.5). The raisers also expected personal benefits to arise directly from the puppies' desirable traits (e.g., calmness) or indirectly due to their own personal development (e.g., learning new skills). Despite being primarily optimistic, those expected benefits to family members, family dynamics, and raisers themselves suggested the potential

applicability of the family transactional dynamics model to the PR contexts even before program commencement.

One week into the program, the raisers in Chur-Hansen et al. (2015) reported actual changes to their lives, primarily negative and attributable to the puppies' problem behaviours, such as indoor toileting, chewing household items, and crying, or simply being highly dependent on the raisers. However, the raisers also listed several benefits from having the puppy: the puppies' cuteness, puppies "acting as a support, soothing to brush, adding structure to the raiser's day, and teaching lessons to the household's children" (Chur-Hansen et al., 2015, p.5). Thus, both the costs associated with PR and the perceived benefits can be translated into the quality of their relationship with their AD puppy, with costs outweighing benefits reflecting lower quality relationships and vice versa. Within this conceptualisation, relationships with the AD puppies were affected differently amongst family members of the raisers. Specifically, puppies' undesirable behaviours imply higher costs to the raisers and those who assume the primary PR responsibilities within the family. Meanwhile, children in the raisers' families who assumed fewer PR responsibilities or lower costs were reportedly enjoying the companionship of the AD puppies or were experiencing other benefits. Therefore, the AD puppies impacted the members within the raisers' family differently.

Undesirable puppy behaviour also negatively affected the raisers' relationships with other family members and those in their personal networks. Puppies' disruptive behaviour and the endorsement of different puppy handling methods were reported to trigger disputes between the raisers and other family members, or with friends and members of the public. The above noted resentments reported in the first week were reported again at three months in the program, with even fewer benefits reported at this time. Below are two illustrations of family-wide adverse effects associated with the puppies' interaction pattern:

Family dynamics were adversely impacted when the puppy favoured one person over [the] others: one couple found they had less time together as the puppy dominated the husband: he found it suffocating and needed “space”. However, another participant discussed the benefits of working as a team in the family, and that if it were only one person, then “neither would enjoy the experience”. (Chur-Hansen et al., 2015, p.7)

In short, AD puppies may form different relationships with different members of the raisers’ family. Depending on the perceived costs relative to benefits, family members may perceive a different quality of their relationship with their AD puppy. These family-wide effects of the AD puppies were clearly observed in Chur-Hansen et al. (2015) study.

Raisers and Family Stabilisation

In response to tensions associated with change, the family as a system tends to regulate itself to achieve the prior lowest conflict levels, a concept regarded as self-regulation (Cox & Paley, 1997). In PR, those efforts involve accommodating the puppies’ needs and are also influenced by other external forces (i.e., instructions and rules from the program provider). Tension may arise from conflict between existing interaction patterns within the raisers’ family and the obligation to adhere to the new rules from the provider. Some raisers in Chur-Hansen et al.’s (2015) study highlighted the difficulties of incorporating program-specific rules, while other raisers deliberately relaxed the organisation’s rules, seemingly restoring the family’s dynamics to their previously accustomed interaction patterns.

The Family Systems theory (Cox & Paley, 1997) also includes the concept of self-organisation, in which family members may rearrange roles amongst themselves to accommodate changes induced by external forces. For raisers, their new role may require them to familiarise and master program-specific puppy handling and training techniques to meet the puppies’ basic and training needs, while family members may need to assume the roles of supporters. Some raisers’ families may not achieve smooth or successful self-

organisation. Therefore, program providers may need to aid this process by providing preparation, training, and ongoing supports. As evident in Chur-Hansen et al. (2015), unsuccessful efforts to achieve family stabilisation and self-organisation during the transition period required the raisers to eliminate external forces, either the program-specific rules or the puppy. Either case would disadvantage the puppies' training outcome.

In short, to improve raisers' program experience, it is crucial first to understand the processes and dynamics within the raisers' family settings, where most of their PR practices take place. Although the current discussion is based on past findings, the aim was to demonstrate the relevance of many processes, and the importance of having sufficient support, as a lack thereof may put the raisers in a position where the raisers' program experiences and their efforts to improve their puppy's behaviour become competing priorities. Further research is required to understand the characteristics and functions of PR programs, so as to successfully promote overall program outcomes concerning puppy behaviour and raisers' program experiences.

Chapter Conclusion

This chapter presented a critical literature review and follow-up discussion. The critical literature review focused on puppy training outcomes and adopted a General Systems Framework (Boulding, 1956; Von Bertalanffy, 1968) to organise existing literature. It was argued that raiser-specific factors will directly influence puppy outcomes, a state of affairs which has been largely overlooked in the AD literature. Following the published literature review, further discussion provided a new perspective centring on the raisers' practices. Relevant family concepts were adopted to explain the complex PR processes from the human end of the PR relationship. The general PR model and the prevalence of raisers' practices served as a framework for research and further discussion in this thesis, presented in Chapters 3 through 6.

Chapter 3:

Exploring Influencing Factors during the PR Programs

Chapter Overview

The previous chapter proposed potential direct influences of raiser practices on puppy behaviour during the PR process and also acknowledged that AD organisations have an ethical obligation to ensure raisers' have a positive program experience, which may also potentially entice the raisers to continue raising other puppies. Chur-Hansen et al. (2015) recruited raiser participants from one program provider. They identified what negatively impacted the experiences of those raisers, some of whom dropped out during the study and others who struggled and expressed hesitation to continue after relinquishing their puppy at the end of the program. Although the ultimate training outcomes of the puppies in Chur-Hansen et al.'s (2015) study were not reported, the PR program in this study was not successful, considering the raisers' mostly negative program experiences.

As Chur-Hansen et al. (2015) already identified what did not work in one PR program, the approach in this chapter was to look for factors helpful to raiser' practices and potentially relevant to puppies' learning during the PR program. Recruiting participants from multiple PR programs provided a greater opportunity to identify helpful factors, while targeting experienced raisers was anticipated to reveal protective factors relevant to their PR practices and program experiences.

The following section presents a study published in *Animals*, titled 'Raising an assistance dog puppy—stakeholder perspectives on what helps and what hinders'. In this study, we recruited 17 participants who were experienced raisers and/or staff of an AD program. The raisers were asked about their PR experiences and staff were asked what they thought about the experiences of raisers. The emerging themes covered both raiser-specific and contextual factors. The section following this study presents further discussion about the findings in light of the general PR model (refer to Figure 2.1) proposed in Chapter 2.

**Paper 2: Raising an Assistance Dog Puppy—Stakeholder Perspectives on What Helps
and What Hinders**

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Article

Raising an Assistance Dog Puppy—Stakeholder Perspectives on What Helps and What Hinders

Dac Mai ^{1,*}, Tiffani Howell ¹, Pree Benton ² and Pauleen C. Bennett ¹

¹ Anthrozoology Research Group, Department of Psychology and Counselling, School of Psychology and Public Health, La Trobe University, Flora Hill, VIC 3552, Australia; t.howell@latrobe.edu.au (T.H.); pauleen.bennett@latrobe.edu.au (P.C.B.)

² Centre for Service and Therapy Dogs Australia, Melbourne, VIC 3162, Australia; Pree.Benton@dogsforlife.com.au

* Correspondence: jimmy.mai@latrobe.edu.au; Tel.: +61-035-444-7317

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Simple Summary: Puppy raisers (or foster families) are volunteers who care for assistance dog puppies until they are ready to learn how to help people with a disability. During this period, some puppies develop behaviours unsuitable for assistance roles and end up changing careers or being rehomed as pets, which is wasteful. Puppy raisers control the early experiences of their puppies, and they vary in their puppy-raising outcomes, but we do not know what specifically helps some puppy raisers produce puppies that are behaviourally suitable for an assistance role. In this study, we interviewed 17 people from seven countries who were either experienced puppy raisers or provider program staff, or both. Their responses suggested several individual factors (*expectations, competency, perseverance and passion*) and social factors (*informational and emotional supports*), in addition to the puppies' characteristics, that influenced the experiences and perceived effectiveness of their puppy-raising practices. These factors are also evident in other well-established areas of research (e.g., education, volunteerism, social support, and organisational performance). We propose recommendations for assistance dog organisations based on those relevant frameworks, which focus on enhancing puppy raisers' competency, positive experiences, and program retention.

Abstract: Assistance dog puppies live with their raisers for up to 16 months before entering advanced training and, hopefully, becoming qualified to help people with a disability. Almost half of the puppies fail to meet the behavioural standards required for assistance dogs, and some puppy raisers produce more behaviourally favourable puppies than others. It is unclear what factors influence puppy-raising practice quality. To understand this, we interviewed 17 participants, including experienced puppy raisers ($n = 8$), provider organisation staff ($n = 4$), and those who have served both as puppy raisers and staff ($n = 5$). Results of a thematic analysis suggest three groups of influencing factors, namely *intrapersonal factors, social support, and puppy characteristics*. Intrapersonal factors such as *expectations, competency, perseverance and passion* were reported to influence puppy raisers' experiences, puppy-raising quality, and continuity of service. Contextual factors such as availability of social support (*informational and emotional supports*) and less-demanding puppies both led to positive puppy-raising experiences, while the former also contributed to puppy raisers' perceptions of competency. Future research should quantitatively examine the interrelationships of these factors concerning puppies' behavioural development. Meanwhile, organisations could consider these factors when developing their recruitment and puppy-raiser support programs.

Keywords: puppy raising; program adherence; program satisfaction; organisational performance; program engagement

1. Introduction

There has recently been an increase in demand for assistance dogs; dogs specially trained to help individuals with a disability such as visual, hearing, mobility impairment, autism spectrum disorder, and or post-traumatic stress disorder [1,2]. Many organisations breed or purchase puppies for this purpose. Before being trained and assessed for their ability to safely function in various places and situations, these puppies must be reared, starting as young as six to 12 weeks [3], for up to 16 months before they are suitable for advanced training, which prepares them for their specific work role. Puppy raisers, typically volunteers recruited either from the public [3] or from institutions such as higher education and correctional settings [4,5], provide care and opportunities for the puppies to learn and become familiar with a wide variety of environments and situations.

Although assistance dog provider organisations generally oversee the puppy-raising practices of their volunteer raisers, research has found that puppy-raising outcomes vary widely amongst puppy raisers [6–8]. Although very little information is available about graduation rates for assistance dog puppies in general, it has been reported that approximately half of all guide dog puppies fail to qualify and work in their intended role [1,9,10]. This high failure rate is unacceptable for various reasons, such as economic inefficiency and welfare of the dogs after being disqualified and rehomed [11]. It is of interest, then, that one primary reason for failure is dogs having behaviours unsuitable in public places, defined broadly as behaviours associated with aggressiveness, distractedness, stress and fearfulness [12,13]. Experiences during the raising period are critical to puppies' behavioural development [14–16], and could help reduce puppies' anxiety and fearfulness if appropriately managed [17]. Since raisers have a high degree of control over their puppies' experiences during this time, it is essential to understand what helps and what hinders the practices of puppy raisers.

Research has found that puppies' behavioural outcomes vary among puppy raisers and in favour of those with more experience. Serpell and Duffy [6] found that puppies of raisers who had raised multiple puppies were less aggressive and less fearful when encountering strangers or unfamiliar dogs. Body sensitivity to touch, an undesirable trait generally associated with avoidant behaviours, was also higher in puppies raised by less-experienced puppy raisers [6]. It is unclear, however, exactly why experienced puppy raisers produce more favourable outcomes.

It could be that multiple-time puppy raisers have had more opportunities to acquire knowledge and practice relevant puppy-handling skills, which leads to an increase in their competency. Fratkin [18] reports that experienced puppy raisers rated themselves more highly on the understanding of puppies than inexperienced puppy raisers. Additionally, puppies raised by raisers who self-reported as more knowledgeable and more experienced were also rated significantly more favourably by their raisers on traits relating to dogs' attachment to their raisers, and trainability [18]. These differences are noteworthy and suggest the formation of secure attachments by the dogs to the raisers. Attachment styles are well established in human relationship research and refer to how a person reacts to the demands in their relationships, with characteristic styles typically developing in infancy [19–21]. Research in dog–human relationship suggests similar patterns of attachment to those between children and their parents [22]. Dogs with a secure attachment style are more confident to independently explore novel objects in the presence of their owners [22,23]. Conversely, dogs with an insecure attachment style constantly seek proximity to their owners and typically display signs of distress during separation from their human attachment figures [22,24]. Given the evidence that children receiving a high quality of care during infancy exhibit higher rates of secure attachment [25], it may be reasonable to expect differences in attachment styles in puppies in Fratkin's [18] study as they were raised by raisers with various levels of experience and understanding of puppy raising.

Literature indicates that behaviours associated with insecure dog-owner attachment types (e.g., seeking attention from handlers, becoming agitated when owners show affection to other people, dogs or animals), and/or lower trainability (e.g., less responsive to commands, and less controllable when in public spaces) [26] are generally considered undesirable in existing research on assistance dog puppy raising [16,27]. An alternative explanation for why multiple-time puppy raisers produce better

puppy outcomes could be that puppy raisers who are successful at puppy raising the first time around are more likely than others to continue raising subsequent puppies. In either case, successful puppy raisers should ideally be encouraged to continue to raise subsequent puppies to improve success rates and outcomes for assistance dog organisations and their future handlers. Therefore, the organisation plays a vital role in ensuring positive experiences for, and enhancing retention of, puppy raisers.

Concerning program engagement and satisfaction, insufficient instructions for effective puppy-handling techniques and lack of technical support were found to be detrimental to the experiences of first-time puppy raisers [28]. Chur-Hansen, Werner, McGuiness and Hazel [28] found that lack of preparation and organisational supports impaired first-time puppy raisers' experiences in such aspects as their psychological, physical, and social well-being. These researchers interviewed nine first-time puppy raisers at one guide dog provider organisation, across four time points (i.e., before the puppy's arrival, and at week one, month three and month 13). In the first interviews, respondents reported high expectations for their puppies and anticipated that they would receive positive puppy-raising experiences. However, at the latter three time-points, they repeatedly reported struggling with their puppy's undesirable behaviours and experienced resentment regarding a lack of support and responsiveness from the organisation. These participants reported a need for support, including: more preparation before their puppy's arrival; a more accurate description of the required workload; more training and information, feedback and reassurance from the organisation; and access to a support group. Another common feature was that puppy raisers loosened the rules of the organisation in times of difficulty. Lack of organisational support, therefore, appeared to affect not only the puppy raisers' experiences but also their tendency to strictly adhere to puppy-raising instructions.

Lack of organisational guidance leaves puppy raisers in a position where they have to rely on their own ideas about puppy handling techniques, which may not be suitable [29]. Koda [29] conducted a study to explore how puppy raisers coped with puppies' undesirable behaviours when not receiving any formal guidance on puppy raising, except for a request to not physically punish the puppies. Although the program in Koda's study was provided by a guide dog training organisation, the participants were informed that the lack of formal instruction was part of the design of the study and not the provider's standard practice, and that their puppies would not become future guide dog candidates. Observing at-home practices, Koda found that puppy raisers resorted to personal techniques (e.g., ignoring or distracting a puppy) to stop undesirable behaviours. However, most of the techniques they used were not effective at addressing their puppy's problem behaviours (e.g., biting, vocalising, damaging household items).

These findings suggest that a lack of support and training in effective puppy handling and training techniques is likely to lead to less than optimal puppy-raising outcomes. While this situation, in which raisers were not provided with any guidance at all, may be unlikely in practice, it is clear that puppy raisers' practices vary depending on their experience [6–8] and appear to be affected by levels of organisational support and guidance [28,29]. In this study, we aimed to further explore what is helpful and what needs to be improved to enhance puppy raisers' experiences and their ability to engage in optimal puppy-raising practices.

2. Materials and Methods

The La Trobe University College of Science, Health and Engineering Human Ethics Sub-Committee approved this study (HEC 18-381) on 3 October 2018.

2.1. Participants

Seventeen participants were recruited for this study from 11 assistance dog provider organisations, across seven countries (see Table 1). Inclusion criteria were being 18 years or older, having raised one puppy or being a staff member responsible for a puppy-raising program at an assistance dog organisation, and being able to speak English. Twelve of our participants functioned either as puppy raisers ($n = 8$) or staff ($n = 4$). One participant (SR09) had been a staff volunteer for five years before

raising her first puppy at the time of the interview. The other four were puppy raisers serving as staff or mentors/counsellors for other puppy raisers; one of them (SRF17) was the founder and head trainer of their organisation and was the person who bred and raised all of the puppies, with support from volunteers and other trainers. The organisations represented train and provide dogs for various assistance roles including, but not limited to, guide dogs, hearing dogs, and mobility dogs.

2.2. Materials

Interviews were guided by two semi-structured interview schedules (see Table S1), one for puppy raisers and another for staff. A selection of questions from both versions guided interviews with experienced puppy raisers who also served as staff or mentors/counsellors. Initial questions asked about the respondent's experience (for puppy raisers) or perceptions (for staff) of the puppy raiser role, and what contributed to successful puppy raising. Other questions were designed to explore what was helpful and challenging about puppy-raising practices. Where applicable, references to difficulties experienced by respondents when raising their first puppy were followed up with questions such as (1) what they did, (2) what their organisation did, or (3) what, if anything, they believed should have been done differently in response to those situations.

Table 1. Participants' roles and their experiences.

Code	Role	Country	No. Puppies Raised
R01	Puppy raiser	Australia	1
R02	Puppy raiser	Australia	2
R03	Puppy raiser	Canada	10
R04	Puppy raiser	Czech Republic	1
R05	Puppy raiser	Denmark	7
R06	Puppy raiser	New Zealand	1 *
R07	Puppy raiser	New Zealand	1
R08	Puppy Raiser	United States	20
SR09	Volunteer staff/puppy raiser	United States	0
RS11	Puppy raiser and staff counsellor/mentor	United States	18
RS10	Puppy raiser and staff-development supervisor	United States	18
RS12	Puppy raiser and staff counsellor/mentor	United States	23
S13	Staff—foster home coordinator	United States	—
S14	Staff—general manager	Mexico	—
S15	Staff—program coordinator	Australia	—
S16	Staff—program assistant	New Zealand	—
SRF17	Staff—raiser; founder, head trainer, and raiser of all puppies	United States	— **

* This participant had raised one puppy from the beginning until it was rehomed, followed by short-term raising of six other puppies. ** This person had bred and raised many puppies but could not specify the exact number.

2.3. Procedure

A total of 143 organisations from 19 countries, of which contact details were publicly available on their websites, were sent an email with information about this study, with a request to notify their staff or puppy raisers about the study. Interviews were conducted via teleconference over five months from November 2018 to March 2019, with lengths ranging from 30 to 70 min. All interviews were recorded and transcribed verbatim. Participants then received their transcriptions to check for accuracy and suggest any modifications. The data set was then analysed using QSR International's NVivo 12 qualitative data analysis software [30].

2.4. Data Analysis

An inductive content analysis [31] was used to condense data into a meaningful conceptual model. Data collected were validated from both the participants' and the researchers' perspectives as per Creswell and Miller [32]. From the lens of the participants, data were validated through member checking, whereby we returned the interview transcripts for affirmation and modification [32]. On the researchers' side, validation was conducted through triangulation, a procedure whereby data are collected from different sources to investigate a topic [32,33]. The current study collected data from participants with different roles, such as puppy raisers, staff, and puppy raisers serving as staff/mentors. We also recruited participants from different countries and from different organisation types (e.g., guide dogs, hearing dogs, mobility dogs). This enabled us to explore a wide range of experiences and aspects of puppy raising, allowing for cross-validation of the emerging themes, and ensuring the data were enriched and our understanding deepened by inclusion of multiple perspectives [33,34].

Data were analysed thematically as per Braun and Clarke [35]. Emerging themes were validated via extensive discussions among the authors, as well as with another researcher who is proficient in using qualitative methods in assistance dog research and was independent of this study. Throughout the results section, direct quotes are presented to give voice to the participants. However, to aid readability, participants' repetitions and filler words (e.g., 'um, well, um ... ') are removed. Where appropriate, additional information in parentheses provides contextual explanations, whereas square brackets indicate grammatical corrections and replacement of identifiable information.

3. Results and Discussion

The thematic analysis suggested three categories of factors affecting puppy-raising practices, namely: intrapersonal factors, social support, and puppy characteristics.

3.1. Intrapersonal Factors

3.1.1. Expectations

During first-time puppy raising, having unrealistically high expectations for the puppy's training progress was reported as unhelpful, resulting in negative experiences for the puppy raiser. One puppy raiser (R05) expressed that they were *"very afraid of making mistakes [and] very worried that [their puppy] wouldn't be good enough"*. One staff added to this saying that *"[puppy raisers] put more pressure on themselves sometimes than [their organisations] even do to get things right."* (S15).

Most puppy raisers reported having more reasonable expectations after raising their first puppy. One puppy raiser narrated:

"I think because she was going to become a mobility dog, I had quite high expectations of her behaviour when she was really young that I don't have any more with so many other puppies coming through. I still do have high expectations of them, but probably not as unrealistic as they were when the first puppy came through. Because they're growing into a mobility dog, you almost expect them to be little mini mobility dogs when they arrive and behaving more reasonably than a little puppy does usually, the tiny puppy that usually runs around and wants to have fun." (R06)

The reported adverse effects of having unrealistically high expectations on puppy-raising experiences in the current study were in line with the literature in organisational research [36]. Job expectation refers to what employees believe they could achieve on that job, whereas realistic expectations concern the expectations that they could eventually confirm as being met [37]. Having unrealistically high job expectations, which are likely unmet, results in negative attitudes in employees towards their jobs [36]. On the other hand, new employees with more realistic expectations were found to have higher job satisfaction and lower turnover rates [38–40].

Although this indicates that it would be beneficial for organisations to provide their prospective puppy raisers with a thorough description of the puppy raiser role, merely receiving information about

puppy raising may not result in development of realistic expectations. Research on social learning in other contexts has found that individuals who observed or received information were not as realistic in judging the difficulties of tasks as those who performed them [41]. This confirms that information is not a substitute for experience. Although it is beneficial for organisations to provide information to help their first-time puppy raisers form more realistic expectations of this role, a complementary strategy might be to offer a range of short-term fostering experiences, such as supervised weekend puppy sitting for puppies of various ages and states of training, before asking puppy raisers to sign up for a year-long role. While logistically challenging, this preparation period could be a prelude to accepting a volunteer as a puppy raiser. This would not only provide interested volunteers with realistic expectations about various stages of the puppy-raising role but also allow organisations to assess if their volunteers have acquired the necessary skills and knowledge to handle and train puppies at different developmental stages.

3.1.2. Competency

Not surprisingly, puppy-raising competency enables puppy raisers to respond effectively to their puppy's issues, while lack of competency negatively affects their ability to raise their puppy effectively. Most participants reported the importance of raisers having adequate knowledge and skill levels necessary to raise puppies to the quality required of a trained assistance dog. Lack of competency also negatively affected their experience. One puppy raiser recalled *"I remember the first few months being quite difficult because I wasn't sure what I was supposed to do."* (R06).

Several other participants echoed this sentiment, suggesting that first-time raisers are particularly disadvantaged and that raising subsequent puppies is less stressful because raisers can anticipate challenges in advance and have plans in place to deal with their puppy's issues. One participant (SR09) who had volunteered as staff for five years prior to raising her first puppy still reported challenges when raising a puppy for the first time:

"As a first-time raiser, I'm learning as much as the puppy is. I didn't know how to handle it right. If I were raising a second time, I'd be a much better puppy raiser. I think my puppy would have learned things quicker, or earlier at least." (SR09)

Lack of puppy-raising understanding, particularly the ability to anticipate what is involved in raising assistance dog puppies, clearly negatively affects experiences and practices of first-time puppy raisers. These findings may explain previous results demonstrating better behavioural outcomes [6] and higher self-rated puppy-raising understanding [18] amongst experienced puppy raisers. Our findings suggest a causal pathway, shown in Figure 1, in which experience increases raisers' understanding of puppy behaviour, enabling them to feel more confident, predict challenges, and respond to them more quickly and effectively, thereby improving outcomes.

learning [42], prior knowledge not only provides a foundation on which new understanding is formed but can also interfere with the knowledge acquiring process. Existing knowledge and experiences are activated and compared when encountering new ideas and knowledge. High similarities of current understanding enhance retention of the novel learning, whereas contradicting prior knowledge hinders the learning process [43].

A problem for puppy-raising organisations, then, is a general lack of consistency in dog training methods used in the community, which has been a topic of discussion in the literature concerning companion dog owner populations [44,45]. Todd [44] suggests that a lack of knowledge and regulation in the dog training industry poses barriers to dog owners adopting humane training techniques. Similarly, Feng, Howell and Bennett [45] found that it takes specific skills and knowledge to efficiently use clicker training, a reward-based dog training method, and that most of those who endorsed this method were professional dog trainers and trained dog owners. Dog owners with limited experience in dog training, on the other hand, were more likely to adopt dog training methods other than clicker training, including reward-based methods such as verbal praise and patting, and verbal and physical punishment [45]. This situation seems unlikely to change in the foreseeable future. Therefore, puppy-raising organisations should be strongly encouraged to restrict recruitment of puppy raisers to those people who have experience with compatible dog training techniques, or who at least express a willingness to embrace the required approach.

3.1.3. Barriers to Help-Seeking Behaviour

A lack of awareness about puppy raising was unhelpful to puppy raisers. Reflecting on their first-time puppy-raising experience, one puppy raiser (R08) reported that, although they were aware of the availability of supports, a lack of understanding of when to seek help left them feeling unsupported. This puppy raiser suggested: “[Organisations should] tell us things that we don’t even know to ask, for first time raisers. After that, I think we [would be] a little more relaxed, or we know when to reach out for help.” (R08).

Perceived judgement from others was also a barrier to seeking help and negatively affected inexperienced puppy raisers’ learning. In the current study, although puppy raisers reported being aware of different types and sources of support available to them, being afraid of judgement about their puppy-raising performance resulted in hesitation to reach out for help and advice. One puppy raiser said: “I know raisers in my group were always like ‘well I don’t wanna bring that up because then you’ll think that I’m not doing a good job’” (RS12). To address a similar issue, one program supervisor described what their organisation had done:

“We’ve tried to really create a safe environment so that it’s okay to ask questions. We’re always going to be there to help and support you. We’re not going to criticise or tell you that you’re wrong or that sort of thing. So, even in our sessions that have first-time raisers, [they] are willing to get up and to try something, which they wouldn’t do that if they didn’t feel safe. That’s really important to us.” (RS10)

The influences of perceived judgement on help-seeking behaviours have been a research focus in a higher education setting [46,47]. Grayson and colleagues [47] found that perceived judgements that threatened self-esteem kept tertiary students from seeking academic advice from their tutors and lecturers. It was also noted, however, that there was a tendency to reach out to instructors for assistance if students perceived potential negative judgements for not seeking help. This latter finding suggests a possible way to promote puppy raiser’s help-seeking behaviour—by expressing to them that there may be some disadvantages for not seeking help, rather than for seeking help unnecessarily or inappropriately. Reported efforts to eliminate negative attitudes towards help-seeking, described above in the quote from a participating program supervisor (RS10), appear to demonstrate that this approach may have merit in the context of puppy raising.

3.1.4. Perseverance and Passion

As discussed previously, it is in the best interests of assistance dog organisations that puppy raisers should continue raising puppies as they gain competency and develop more realistic expectations. One condition of this is that they need to work through the process of raising their first puppy, despite the presence of challenges. A second condition is that they need to learn from this experience, to develop appropriate competencies. When examining the effects of a construct known as ‘grit’ on the attainment of challenging undertakings, Duckworth, et al. [48] found that sustained perseverance and passion contributed more to success than intelligence or personality type. According to these authors, perseverance refers to the continuity of practice, while passion refers to positive attitudes towards engagement in that practice. Although these two dimensions are conceptually distinct, the former is often conditional on the latter.

Still, most of us can identify examples where passion and perseverance are not sufficient to develop expertise. In the current study, participants frequently referred to a sense of achievement as a source of motivation or passion to persevere with puppy raising. This sense of achievement was associated with being able to see progress towards achieving the goal of raising a high-quality dog, which is a driving force to help puppy raisers proceed through the long process of puppy raising and also to progress to a second or third puppy. Presumably, puppy raisers who are passionate and persistent but who fail to achieve the required competencies would be less likely to continue, although organisations might do well to remove volunteers who continually produce poorly behaved dogs from their pool, even if this risks bad publicity.

Most of the participating puppy raisers reported finding it helpful to engage in self-motivation and to reassure themselves to keep pushing through difficult times during their first-time puppy raising. One puppy raiser (RS12), who mentored other puppy raisers, suggested that “[*what we should do when experiencing*] difficulty is taking [a] deep breath and go okay everything [is] fine. You know, we’re just [*going to*] proceed calmly with the thing we need to do and get on with it.”

In contrast to a sense of achievement, there was one reported factor related to passion for the puppy-raising process, which could potentially hinder a raiser’s intention to deal with challenging behaviour and to set the puppy up for success. This was a high attachment to their puppy. One experienced puppy raiser and mentor shared:

“[It’s] always in the back of your head [that] you’re going to have to give this dog up. In the beginning, you’re like: ‘Oh yeah, I can do it.’ As time goes on, you’re like: ‘Oh man, is there something I can do to mess this dog up, so it doesn’t make it?’ I mean, there’s an emotional component there.” (RS10)

One might hope that, in practice, very few puppy raisers would actively jeopardise their puppy’s training so they could later adopt it. Nonetheless, attachment to a puppy and a reluctance to relinquish it may be demotivating in terms of addressing the puppy’s undesirable behaviours, reducing the strength of the raiser’s good intentions. Regarding the concept of grit, this might mean that the raiser lacks the necessary willingness to persevere with difficult tasks and may subsequently be less likely to raise any future puppies.

Another factor that may affect volunteers’ sustained motivation during puppy raising is differences in their reasons for participating in a puppy-raising program. Clary, et al. [49] suggest that people vary in their motivations to participate in voluntary work. Reported motivations to be a puppy raiser in the current study were not limited to helping other people, but also extended to learning dog training skills, trialling dog-ownership before acquiring a family dog, and a desire to have a dog or a puppy.

According to Self-Determination Theory (SDT) [50], the above reasons are autonomous motivations, with sources internal to the person [50]. These contrast with controlled motivations, the external sources of reward and punishment that regulate one’s behaviours [50]. Controlled motivations may be less relevant to the context of puppy raising because this practice is primarily voluntary. Autonomous motivations have been found to predict incremental work efforts and high program engagement amongst volunteers in other contexts [51–53]. In the context of puppy raising, the desired types of

autonomous motivations favouring a puppy's success could be to provide assistance dogs to help other people or to improve their own dog training competency. Although, some puppy raisers' initial motivation may be to enjoy puppy companionship, this may not be hindering so long as they also have autonomous motivations to produce high-quality puppies. Given the previously discussed negative impact of raisers having a strong attachment with their puppies, it is then advisable that organisations promote and reinforce the desirable kinds of motivations in their puppy raisers. A way to do this may be by providing prospective puppy raisers with information about the positive impact of their puppy raising on both their puppy and the future handler.

In summary, having prior experience in puppy raising understandably enables puppy raisers to raise and train their puppies more successfully. In the absence of prior experience in assistance dog puppy raising, experience with general dog training can be helpful, provided the preferred training technique is in harmony with the techniques and philosophy of the puppy-raising organisation. Where prior experience is not available, puppy raisers must be encouraged to access appropriate supports, which requires providers to promote appropriate attitudes toward help-seeking behaviours, making them feel less negatively judged for accessing supports than they are for not accessing supports. Novice puppy raisers typically lack awareness of potential problems and therefore find it challenging to know when support is needed. Other factors that appear instrumental in terms of promoting good practice are motivations and passion for achieving the desired outcomes, and a puppy raiser's ability to persevere during challenging events. Predicting puppy-raising challenges and providing appropriate information and support before these occur is likely to be a critical process for puppy-raising organisations.

3.2. Social Support

The above analysis confirmed the generally demanding nature of puppy raising, especially for novice puppy raisers [28], whose strategies to cope with puppies' development of undesirable behaviours may be ineffective [29]. It also highlighted the importance of puppy raisers receiving appropriate support. In the current study, all puppy raisers reported receiving different types and degrees of support from both staff and other puppy raisers at their organisation as well as people external to the organisation. These various supporters were reported to have helped the puppy raisers by providing: (1) informational support, including formal instructions, informal sharing of advice or information, or direct assistance with training and socialising; and (2) emotional support, including reassurance and sharing of experiences and responsibility for puppy raising.

3.2.1. Informational Support

Participants from different organisations reported receiving various forms and amounts of informational support. What was consistent was the reported advantage of receiving information in multiple modalities, to meet different types of needs and learning styles of puppy raisers. One illustration of this was different attitudes observed towards puppy-raising manuals, the most popular form of informational material received by participants. Most puppy raisers suggested that manuals provided them with relevant information, particularly when they were written in simple language and did not require prior foundational knowledge. On the other hand, one puppy raiser (R08) revealed that having many things to read overwhelmed them when they raised their first puppy.

Some puppy raisers had several options for obtaining information about puppy raising, such as a telephone hotline and in-person support. One puppy raiser explained that *"if you can't find the answer in there (the manuals), you can always call someone at [the organisation] in the puppy development (department) and they can try to help you over the phone."* (RS11). Other forms of information were also available to puppy raisers to ensure they could find answers they needed, such as video demonstrations, an online library, videoconferencing or in-person support during training sessions, home visits and occasional appointments.

In some ways, puppy raisers can be considered apprentices, receiving instructions provided by their organisations as they acquire puppy handling skills. Relevant to adult skills learning is the

Cognitive Apprenticeship (CA) approach [54,55], which suggests developing apprentices' ability to master tasks in a simulation setting before entering the real world, and that they may learn better with access to alternative methods when an initial approach fails to help. In the context of puppy raising, an opportunity for puppy raisers to be well-prepared by their organisation before obtaining the first puppy would be ideal but may be unrealistic to achieve, given the high demand for puppy raisers to start immediately, and the necessity of negotiating various developmental periods when raising a puppy. Short-term fostering opportunities may be of assistance. In addition, the reported benefits of having back-up sources of information deserve further research attention as this appears to accommodate preferences for different instructional methods.

The CA approach highlights a critical role for instructors in the learning process of apprentices, which often begins with a repeated demonstration of relevant tasks and then gradually fades to intensive supervision and active monitoring, and eventually less supervision and provision of support only when asked [55]. This process ends when the apprentice fully masters the required skills and can generalise to broader contexts and a range of situations. Regarding supervision in the context of assistance dog puppy raising, the current findings suggest that this activity generally involves routine visits from responsible personnel to meet directly with the puppy raisers regarding their puppy-raising practices. Frequent program supervision allowed staff to detect any undesirable behaviours appearing during the puppies' psychological development. For instance, one puppy raiser (S14) maintained that *"proper follow up is super important. If a puppy gets sensitised (to a certain stimulus) and [staff] don't notice it, it's like a time that has been lost. So [it is helpful to have] proper follow up once a week."*

Intervals between check-up sessions varied among different organisations in the current study, from weekly to monthly or only a few times per year for those who lived far away from their organisation. During supervision, puppy raisers reported having the opportunity to practice relevant skills and receive feedback on how their puppy-raising practices adhere to the organisation's guidelines. Considering the importance of adhering to strict rules as instructed by the organisation, supervision allows for staff to reward correct practices and advise when puppy raisers do otherwise. One program supervisor explained:

"As far as following written instructions, I'm not impressed at all. We have them sign a checklist that says you will never allow this puppy to be off leash in an unenclosed area. And then people will post pictures on [online social media] of their puppy doing exactly that thing. So, if we put a rule into place but we don't follow up or supervise them on that, over time they're going to do whatever they want to do because they know it's not going to be enforced." (RS10)

While some raisers relied only on advice from their trainers, others preferred to seek help from those who had gone through the same situations. Overall, puppy raisers were positive about the opportunity to train and socialise their puppy with other puppy raisers. One puppy raiser stated:

"You can read the puppy manual, you can read the timeline, you can get impressions on [social media] of what people are doing and what it should look like, but you don't really know until you see other puppy raisers, and that those experienced puppy raisers might have a tip or two that really resonates with that first-time raiser and helps them out." (RS10)

Program providers also acknowledged this source of informational support. One staff member explained why peer support might be helpful and what they have done to be resourceful:

"I think the new raisers are very eager and they're wanting to learn, and they're very intrigued by the process, and you can't cover everything. So, it's just a matter of when you see something happening, explaining a different way of doing it. And then what we're trying to do now, is when we have an experienced raiser, we try to buddy them up, so give them a mentor, that, if you have questions on how to do something, this is your mentor [when a] staff member isn't available." (S13)

To ensure appropriateness of advice offered by fellow puppy raisers, one puppy raiser (R03) said that *“there’s always a mediator in the group [who] would say, ‘okay this is not for fellow foster families to answer this, it is a matter of questions that must be directed to staff members.’”* While experienced puppy raisers would be able to support the more novice ones, for their own enquiries, they *“would then go more to the trainers, because they want to learn more and why this is happening”* (R03).

The informational supports that puppy raisers reported receiving from peers were in line with findings from research in educational settings [56–58]. Peer-teaching is one application of a scaffolded learning model [59], which highlights the importance of learning from those with higher ability but not exceeding the learner’s ‘zone of proximal development’ [60]. The zone of proximal development is when the demands of the tasks lie between the learner’s actual ability and a slightly higher but still achievable level of competency. As evident in the current study, experienced puppy raisers reported learning more from professional trainers while inexperienced ones would benefit greatly when learning from peers who were slightly more advanced than them. Organisations could also consider enhancing this peer learning process with support from suitably trained and accredited mediators to ensure their puppy raisers receive appropriate advice for their enquiries.

3.2.2. Emotional Support

Besides formal and informal informational supports provided by program providers and other experienced puppy raisers, emotional support was necessary for puppy raisers, particularly novices. This type of support came from members of their organisation (e.g., staff and other puppy raisers) and those in existing networks (e.g., family and colleagues at their workplace).

One desirable attribute of staff was an ability to facilitate their helping relationships with puppy raisers. For instance, presenting themselves as being accessible, supportive and patient was reported as being what encouraged puppy raisers to elaborate further on difficult situations they were encountering. One puppy raiser said:

“But more or less we’ve been having a regular weekly walk with [our dog trainer] with as many of us who can get there, with all these puppies, and that’s made a really big difference. Not only to the socialisation of the dogs, which has been a real bonus of that but as raisers being able to have these quiet conversations about you know, ‘Does your dog do this? Mine does this all the time. What do you do? This is terrible. Can’t bear it’ or positive stuff.” (R06)

Almost all puppy raisers and mentors reported that puppy raisers also benefited from emotional support provided by other puppy raisers in their organisation, both when dealing with puppies’ undesirable behaviours, and while grieving after returning their puppy to the organisation. One mentor/senior puppy raiser (RS12) attributed this to other puppy raisers’ experience and ability to relate to what they were going through. Puppy raisers reported that they tended to team up so that their socialising and training sessions would be more comforting as they could turn to someone else for help. Another mentor/senior puppy raiser explained:

“[Other puppy raisers] who have done this before and can kind of show and answer some of the questions that are hard. Like how hard it is to return the dog and you know, what happens when that goes on. They can be very supportive of each other. That’s a good thing on [a social media platform] if they’re having problems or if their puppy does not make the program or that sort of thing. There’s a lot of good comforting comments that can be shared from older or from repeat raisers as well.” (RS10)

A few puppy raisers also received emotional support from people in the puppy raisers’ networks, such as friends or family members. One puppy raiser who lived alone shared their experiences of receiving support from neighbours for training their puppy. Others reported that family members were able to share the responsibility or help in some capacity, such as taking care of a puppy temporarily. One puppy raiser/mentor highlighted the importance of household members’ involvement in the puppy raising:

“[Y]ou don’t want to be placing a puppy in a family where somebody [does not] want anything to do with this, you know, that always makes [it] harder on the raiser. So that the whole family kind of need to buy into the fact that you’re going to be raising the special puppy to be [an assistance dog] puppy.” (RS12)

Puppy raisers who were able to take their puppy to work reported positive experiences when receiving support from their workplace. Flexibility in workplace arrangements, such as working from home or allowing puppies at work, allowed puppy raisers to fulfil their responsibilities as a puppy raiser.

It appears that, during puppy raising, and especially during difficult times, puppy raisers benefit from different types of support (i.e., informational and emotional) and different sources of support (i.e., staff, fellow puppy raisers, family members, and colleagues). To highlight the importance of social support, one puppy raiser (RS12) repeatedly asserted that “it will take [a] village to raise the [assistance dog] puppies.” This finding is in line with the social support model proposed by Cohen and Wills [61], which holds that social support has two dimensions, functional and structural. The functional dimension includes instrumental support, such as financial aid and essential materials, and more intangible support, such as emotional support and information. Structural support, on the other hand, concerns the social connections of the individuals that provide different types of support. On this dimension, support can come from family, friends, organisations or social groups.

Regarding the reported positive effects of social support, the findings of the present study are in line with past research in human child-rearing [62,63], a practice which shares several similar characteristics with raising and educating a puppy. In the context of human child-rearing, a wide range of supports can be beneficial, and it is not easy to ascertain which support structures help with what issues specifically [62]. Social support, in general, is consistently found to act as a protective agent against parental burnout, depression, and stress [63–65]. The results presented in this paper suggest that this is also relevant to puppy raisers, with various types of social support, being provided by multiple sources, being a helping factor in enhancing the experiences of puppy raisers.

3.3. Puppy Characteristics

A third component that directly influences puppy-raising practices is the characteristics of the puppy itself. Puppies have been discussed in the assistance dog literature as the inputs (puppy breeding and selection) [66,67] and the products (puppies’ graduation and adult behaviours) [1,9,10] of the puppy-raising process, though little has examined how their characteristics influence this process. In the current study, puppy temperament was a factor affecting puppy raisers’ experience. A few puppy raisers reported that it would have been easier for their first-time puppy raising if the puppy had been less challenging. Other puppy raisers attributed having an easy-going puppy to their positive first-time puppy-raising experiences. One puppy raiser recalled:

“I think the [puppy] had a really good personality for being [an assistance] dog because he was super calm everywhere, so I never had a problem when I took him to the subway or bus, there was no issue with him, he was just, ‘Okay, sit here’, and he was sitting and doing nothing, so in this way it was easy for me. And at home, I learnt [that] it’s a puppy, he was very playful.” (R04)

In addition to considering puppies’ different levels of difficulty, one participating program coordinator elucidated how they also consider physical factors of the puppy raisers when placing their puppies:

“I’ve had a gentleman: a really tall, really deep voice, and older gentleman, and I wouldn’t give a really soft natured puppy to him because the deepness of his voice could accidentally frighten a softer-natured pup. So, the more outgoing ones would go there. My little old lady in a retirement village has got a small female puppy that’s just very laid-back and is absolutely thriving with her. Yeah, we do look at that when we’re placing pups.” (S15)

Puppy raisers appeared to prefer puppies whose behavioural demands were at levels they perceived they could manage. In the companion dog literature, undesirable characteristics, such as aggression, chasing, high energy, unfriendliness, distractibility, fearfulness, destructiveness, vocalisation, disobedience, soiling inside, jumping on people, and escaping [68] are the main reasons owners relinquish dogs to shelters. The former six have been explored in assistance dog research looking at breeding and selecting for suitable puppies [69–71]. However, to date, the latter six undesirable behaviours have not been studied in the assistance dog literature. In other words, puppy selection may filter out traits deemed unsuitable for public access; i.e., aggression, chasing and fearfulness, but may not reduce other traits associated with household-management issues. While puppies vary in their temperament and personality [72,73], the current findings suggest potential benefits to puppy raisers when matching puppies' demands with puppy raisers' level of experience, competency and their lifestyle.

4. Summary and Conclusions

Assistance dog puppy raising is generally a demanding job, especially for inexperienced puppy raisers. Previous research has suggested that experienced puppy raisers are more successful in puppy raising [6], but has yet to explain why. This study aimed to explore what helps and what hinders quality of assistance dog puppy raising. The results reveal three categories of factors that experienced puppy raisers and staff reported as affecting puppy-raising practices, namely *intrapersonal factors*, *social support* and *puppy characteristics*. Figure 2 illustrates proposed interrelations and effects of these factors on *puppy-raising practices*, which then directly influence puppies' future behavioural outcomes. The intrapersonal factors include expectations, competency, passion and perseverance. These factors influenced puppy raisers' perceived ability to raise puppies effectively, and whether they went on to raise more puppies and, hence, gained further experience and competency. This model extends upon the mediation model proposed in Figure 1 to suggest that, although experience contributes to raisers' puppy-raising knowledge and competency, it is only one of several factors contributing to their overall puppy-raising practices. Social supports refer to different support types (informational and emotional), and sources of support (staff/organisation, other puppy raisers, family and friends) available to assist with puppy raising. While competency takes time and experience to develop (through perseverance), puppy raisers with low competency may benefit from receiving informational and emotional support from various sources when challenges arise. In addition, inexperienced raisers may find it more manageable to handle less-demanding puppies, or to practice puppy-raising skills with 'easy' puppies before engaging in their own puppy-raising practice.

Following on from the current findings, future research in assistance dog puppy raising should quantitatively measure the factors we identified at an individual level, such as puppy raisers' competency and program engagement, and at a contextual level, such as overall supports received by puppy raisers. The contextual variables could then be correlated with puppy raisers' practices and used to inform predictive models to establish which factors are most influential in determining puppies' behavioural outcomes. While selecting competent and committed puppy raisers and less demanding puppies may be an ideal option, it is not always practical. Organisations may, therefore, need to take advantage of different sources and types of supports to ensure their puppy raisers have (1) realistic expectations of their puppy raising, (2) efficient learning and skills acquisition, and (3) sustained motivation to provide high-quality puppy-raising practices (see Table 2 for a summary of influencing factors and practical recommendations). If puppy-raising practices can be improved even marginally, such that fewer puppies fail to succeed, the potential benefits for assistance dog organisations and the clients and communities they service could be profound.

family and friends) available to assist with puppy raising. While competency takes time and experience to develop (through perseverance), puppy raisers with low competency may benefit from receiving informational and emotional support from various sources when challenges arise. In addition, inexperienced raisers may find it more manageable to handle less-demanding puppies, or to practice puppy-raising skills with 'easy' puppies before engaging in their own puppy-raising practice.

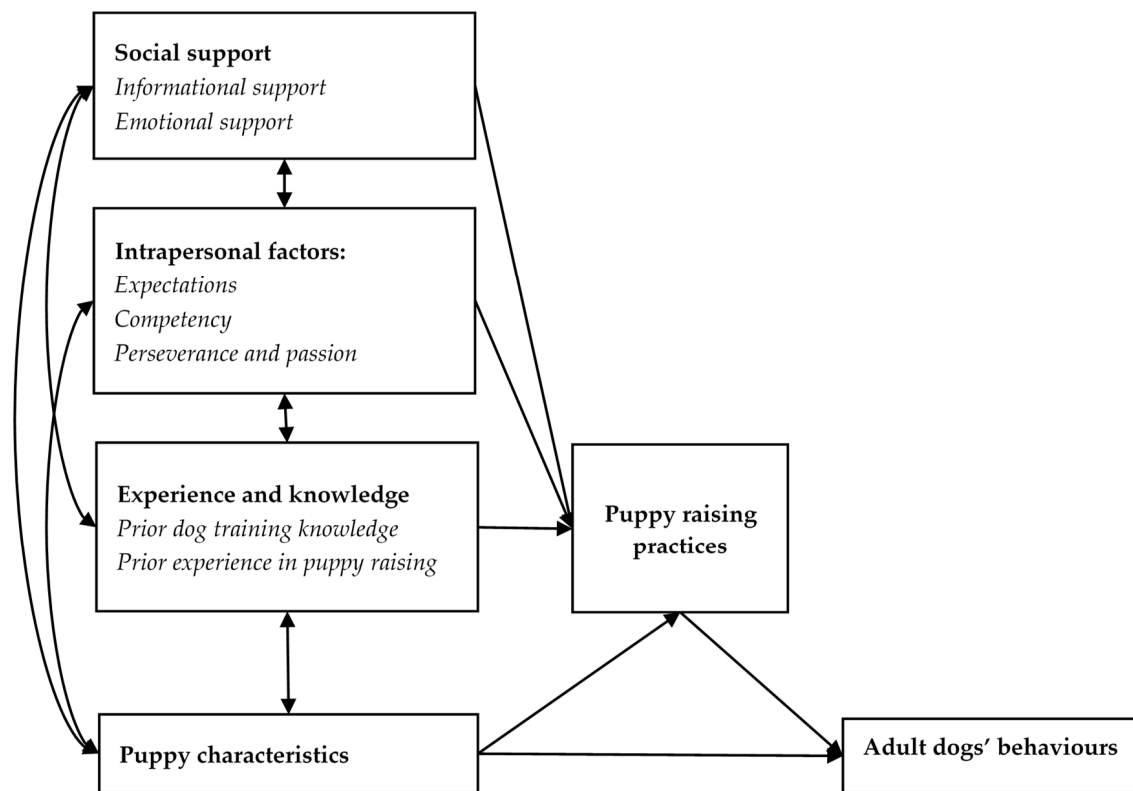


Figure 2. Proposed interrelations between various factors affecting puppy-raising practices.

Figure 2. Proposed interrelations between various factors affecting puppy-raising practices.

Table 2. Summary of factors affecting puppy raising and recommendations for organisations.

Following on from the current findings, future research in assistance dog puppy raising should	
Factors	Recommendations for Organisations
quantitatively measure the factors we identified at an individual level, such as puppy raisers' competency and program engagement, and at a contextual level, such as overall supports received.	
<i>Expectations.</i> Having unrealistically high expectations of puppies' training and behavioural development compromised positive experiences of puppy raisers.	Encourage realistic expectations through careful instruction and short-term experiential puppy raising.
<i>Competency.</i> Puppy-raising competency requires time and learning from prior experience to develop, and is critical in promoting favourable behavioural outcomes.	Provide prospective puppy raisers with information on canine behavioural development and puppy handling, as well as opportunities to practice training and socialisation skills under supervision.
<i>Barriers to help-seeking behaviour.</i> Puppy raising is challenging. Not knowing when to ask for help or perceiving judgements from others as negative hinders help-seeking behaviour.	Create a safe and non-judgemental environment to encourage help-seeking behaviours in puppy raisers, particularly the novice ones.
<i>Perseverance and passion.</i> Developing puppy-raising competency requires puppy raisers to persevere during times of difficulty, and positively appraise such perseverance.	Promote perseverance and passion by celebrating small achievements and ongoing contributions of puppy raisers.
Social support	
<i>Informational support.</i> Puppy raisers need to receive answers to inquiries promptly and in a form they prefer (e.g., in-person, written, or via telephone)	Provide accessible information and guidance from different sources and in different modalities. A qualified moderator may help redirect puppy raisers' inquiries to those with relevant expertise.
<i>Emotional support.</i> Puppy raising is emotionally challenging at times, especially for inexperienced puppy raisers.	Establish puppy raisers' support groups and involve family members and supportive others in the training and handling of puppies.
Puppy characteristics	
Puppies vary in their temperaments and behavioural characteristics. Some are more challenging than others. Puppy raisers with less experience may deal better with less challenging puppies.	Prioritise the placement of less-challenging puppies with novice puppy raisers. Puppies with behavioural issues (fearful avoidance, or high levels of energy) should be placed with puppy raisers with relevant competencies.

Supplementary Materials: The following are available online at <http://www.mdpi.com/2076-2615/10/1/128/s1>: Table S1: Interview schedules for puppy raisers and staff.

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References

1. Wirth, K.E.; Rein, D.B. The economic costs and benefits of dog guides for the blind. *Ophthalmic Epidemiol.* **2008**, *15*, 92–98. [CrossRef]
2. Sachs-Ericsson, N.; Hansen, N.K.; Fitzgerald, S. Benefits of assistance dogs: A review. *Rehabil. Psychol.* **2002**, *47*, 251–277. [CrossRef]
3. Batt, L.; Batt, M.; Baguley, J.; McGreevy, P. Relationships between puppy management practices and reported measures of success in guide dog training. *J. Vet. Behav.* **2010**, *5*, 240–246. [CrossRef]
4. Cooke, B.J.; Farrington, D.P. The effectiveness of dog-training programs in prison: A systematic review and meta-analysis of the literature. *Prison J.* **2016**, *96*, 854–876. [CrossRef]
5. Lahman, M.P. By my side: The University's first service dogs. *Health Commun.* **2018**, *33*, 222–224. [CrossRef] [PubMed]
6. Serpell, J.A.; Duffy, D.L. Aspects of juvenile and adolescent environment predict aggression and fear in 12-month-old guide dogs. *Front. Vet. Sci.* **2016**, *3*, 49. [CrossRef] [PubMed]
7. Svartberg, K. Shyness–boldness predicts performance in working dogs. *Appl. Anim. Behav. Sci.* **2002**, *79*, 157–174. [CrossRef]
8. Takeuchi, Y.; Hashizume, C.; Arata, S.; Inoue-Murayama, M.; Maki, T.; Hart, B.L.; Mori, Y. An approach to canine behavioural genetics employing guide dogs for the blind. *Anim. Genet.* **2009**, *40*, 217–224. [CrossRef]
9. Arata, S.; Momozawa, Y.; Takeuchi, Y.; Mori, Y. Important behavioral traits for predicting guide dog qualification. *J. Vet. Med. Sci.* **2010**, *72*, 539–545. [CrossRef]
10. Tomkins, L.M.; Thomson, P.C.; McGreevy, P.D. Behavioral and physiological predictors of guide dog success. *J. Vet. Behav.* **2011**, *6*, 178–187. [CrossRef]
11. Cobb, M.; Branson, N.; McGreevy, P.; Lill, A.; Bennett, P. The advent of canine performance science: Offering a sustainable future for working dogs. *Behav. Processes* **2015**, *110*, 96–104. [CrossRef]
12. Bremhorst, A.; Mongillo, P.; Howell, T.; Marinelli, L. Spotlight on Assistance Dogs—Legislation, Welfare and Research. *Animals* **2018**, *8*, 129. [CrossRef] [PubMed]
13. Guide, Hearing and Assistance Dogs Act 2009 (Qld) s. 35.1 (Austl.). Available online: <https://www.legislation.qld.gov.au/> (accessed on 24 October 2019).
14. Appleby, D.L.; Bradshaw, J.W.S.; Casey, R.A. Relationship between aggressive and avoidance behaviour by dogs and their experience in the first six months of life. *Vet. Rec.* **2002**, *150*, 434–438. [CrossRef] [PubMed]
15. Freedman, D.G.; King, J.A.; Elliot, O. Critical period in the social development of dogs. *Science* **1961**, *133*, 1016–1017. [CrossRef]
16. Vaterlaws-Whiteside, H.; Hartmann, A. Improving puppy behavior using a new standardized socialization program. *Appl. Anim. Behav. Sci.* **2017**, *197*, 55–61. [CrossRef]
17. Rooney, N.J.; Clark, C.C.A.; Casey, R.A. Minimizing fear and anxiety in working dogs: A review. *J. Vet. Behav.* **2016**, *16*, 53–64. [CrossRef]
18. Fratkin, J.L. Examining the Relationship between Puppy Raisers and Guide Dogs in Training. Ph.D. Thesis, The University of Texas at Austin, Austin, TX, USA, 2015.
19. Ainsworth, M.D. Attachments across the life span. *Bull. N. Y. Acad. Med.* **1985**, *61*, 792–812.
20. Bartholomew, K.; Horowitz, L. Attachment styles among young adults: A test of a four-category model. *J. Personal. Soc. Psychol.* **1991**, *61*, 226–244. [CrossRef]

21. Bowlby, J. The nature of the child's tie to his mother. *Int. J. Psychoanal.* **1958**, *39*, 350.
22. Topál, J.; Miklósi, Á.; Csányi, V.; Dóka, A. Attachment behavior in dogs (*Canis Familiaris*): A new application of Ainsworth's (1969) Strange Situation test. *J. Comp. Psychol.* **1998**, *112*, 219–229. [[CrossRef](#)]
23. Horn, L.; Huber, L.; Range, F. The importance of the secure base effect for domestic dogs—Evidence from a Manipulative Problem-Solving task. *PLoS ONE* **2013**, *8*, e65296. [[CrossRef](#)]
24. Schöberl, I.; Wedl, M.; Bauer, B.; Day, J.; Möstl, E.; Kotrschal, K. Effects of owner–dog relationship and owner personality on cortisol modulation in human–dog dyads. *Anthrozoös* **2012**, *25*, 199–214. [[CrossRef](#)]
25. Egeland, B.; Sroufe, L.A. Attachment and early maltreatment. *Child Dev.* **1981**, *52*, 44–52. [[CrossRef](#)]
26. Hsu, Y.; Serpell, J.A. Development and validation of a questionnaire for measuring behavior and temperament traits in pet dogs. *J. Am. Vet. Med. Assoc.* **2003**, *223*, 1293–1300. [[CrossRef](#)]
27. Harvey, N.D.; Craigon, P.J.; Blythe, S.A.; England, G.C.W.; Asher, L. Social rearing environment influences dog behavioral development. *J. Vet. Behav.* **2016**, *16*, 13–21. [[CrossRef](#)]
28. Chur-Hansen, A.; Werner, L.K.; McGuiness, C.E.; Hazel, S. The experience of being a guide dog puppy raiser volunteer: A longitudinal qualitative collective case study. *Animals* **2015**, *5*, 1–12. [[CrossRef](#)]
29. Koda, N. Inappropriate behavior of potential guide dogs for the blind and coping behavior of human raisers. *Appl. Anim. Behav. Sci.* **2001**, *72*, 79–87. [[CrossRef](#)]
30. Welsh, E. Dealing with data: Using NVivo in the qualitative data analysis process. *Forum Qual. Soc. Res.* **2002**, *3*. [[CrossRef](#)]
31. Elo, S.; Kyngäs, H. The qualitative content analysis process. *J. Adv. Nurs.* **2008**, *62*, 107–115. [[CrossRef](#)]
32. Creswell, J.W.; Miller, D.L. Determining validity in qualitative inquiry. *Theory Pract.* **2000**, *39*, 124–130. [[CrossRef](#)]
33. Olsen, W. Triangulation in social research: Qualitative and quantitative methods can really be mixed. *Dev. Sociol.* **2004**, *20*, 103–118.
34. Weyers, M.; Strydom, H.; Huisamen, A. Triangulation in social work research: The theory and examples of its practical application. *Soc. Work Maatskaplike Werk* **2008**, *44*, 207–222. [[CrossRef](#)]
35. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [[CrossRef](#)]
36. Lee, T.W.; Ashford, S.J.; Walsh, J.P.; Mowday, R.T. Commitment propensity, organizational commitment, and voluntary turnover: A longitudinal study of organizational entry processes. *J. Manag.* **1992**, *18*, 15–32. [[CrossRef](#)]
37. Greenhaus, J.H.; Seidel, C.; Marinis, M. The impact of expectations and values on job attitudes. *Organ. Behav. Hum. Decis. Processes* **1983**, *31*, 394–417. [[CrossRef](#)]
38. Buckley, M.R.; Fedor, D.B.; Veres, J.G.; Wiese, D.S.; Carraher, S.M. Investigating newcomer expectations and job-related outcomes. *J. Appl. Psychol.* **1998**, *83*, 452–461. [[CrossRef](#)]
39. Kotter, J.P. The psychological contract: Managing the joining-up process. *Calif. Manag. Rev.* **1973**, *15*, 91–99. [[CrossRef](#)]
40. Bolton, R.; Gold, J. Career management: Matching the needs of individuals with the needs of organizations. *Pers. Rev.* **1994**, *23*, 6–24. [[CrossRef](#)]
41. Fazio, R.H.; Zanna, M.P. Direct experience and attitude-behavior consistency. In *Advances in Experimental Social Psychology*; Berkowitz, L., Ed.; Academic Press: Cambridge, MA, USA, 1981; Volume 14, pp. 161–202.
42. Anderson, D.S.-L.C.E. Constructivism: A paradigm for older learners. *Educ. Gerontol.* **1999**, *25*, 203–209. [[CrossRef](#)]
43. Strangman, N.; Hall, T.; Meyer, A. Background knowledge instruction and the implications for UDL implementation. Retrieved Oct. **2004**, *23*, 2006.
44. Todd, Z. Barriers to the adoption of humane dog training methods. *J. Vet. Behav.* **2018**, *25*, 28–34. [[CrossRef](#)]
45. Feng, L.C.; Howell, T.J.; Bennett, P.C. Practices and perceptions of clicker use in dog training: A survey-based investigation of dog owners and industry professionals. *J. Vet. Behav.* **2018**, *23*, 1–9. [[CrossRef](#)]
46. Clegg, S.; Bradley, S.; Smith, K. 'I've had to swallow my pride': Help seeking and self-esteem. *High Educ. Res. Dev.* **2006**, *25*, 101–113. [[CrossRef](#)]
47. Grayson, A.; Miller, H.; Clarke, D.D. Identifying barriers to help-seeking: A qualitative analysis of students' preparedness to seek help from tutors. *Br. J. Guid. Couns.* **1998**, *26*, 237–253. [[CrossRef](#)]
48. Duckworth, A.L.; Peterson, C.; Matthews, M.D.; Kelly, D.R. Grit: Perseverance and passion for long-term goals. *J. Pers. Soc. Psychol.* **2007**, *92*, 1087–1101. [[CrossRef](#)]

49. Clary, E.G.; Snyder, M.; Ridge, R.D.; Copeland, J.; Stukas, A.A.; Haugen, J.; Miene, P. Understanding and assessing the motivations of volunteers: A functional approach. *J. Personal. Soc. Psychol.* **1998**, *74*, 1516–1530. [\[CrossRef\]](#)
50. Deci, E.L.; Ryan, R.M. Self-determination theory: A macrotheory of human motivation, development, and health. *Can. Psychol.* **2008**, *49*, 182. [\[CrossRef\]](#)
51. Bidee, J.; Vantilborgh, T.; Pepermans, R.; Huybrechts, G.; Willems, J.; Jegers, M.; Hofmans, J. Autonomous Motivation Stimulates Volunteers' Work Effort: A Self-Determination Theory Approach to Volunteerism. *Voluntas* **2013**, *24*, 32–47. [\[CrossRef\]](#)
52. Holdsworth, C. Why volunteer? Understanding motivations for student volunteering. *Br. J. Educat. Stud.* **2010**, *58*, 421–437. [\[CrossRef\]](#)
53. Millette, V.; Gagné, M. Designing volunteers' tasks to maximize motivation, satisfaction and performance: The impact of job characteristics on volunteer engagement. *Motiv. Emot.* **2008**, *32*, 11–22. [\[CrossRef\]](#)
54. Collins, A.; Brown, J.S.; Newman, S.E. Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In *Knowing, Learning, and Instruction: Essays in Honor of Robert Glaser*; Lawrence Erlbaum Associates Inc.: Hillsdale, NJ, USA, 1989; pp. 453–494.
55. Brandt, B.L.; Farmer, J.A.; Buckmaster, A. Cognitive apprenticeship approach to helping adults learn. *New Dir. Adult Cont. Educ.* **1993**, *1993*, 69–78. [\[CrossRef\]](#)
56. King, A. ASK to THINK-TEL WHY: A model of transactive peer tutoring for scaffolding higher level complex learning. *Educ. Psychol.* **1997**, *32*, 221–235. [\[CrossRef\]](#)
57. Van de Pol, J.; Volman, M.; Beishuizen, J. Scaffolding in Teacher–Student Interaction: A Decade of Research. *Educ. Psychol. Rev.* **2010**, *22*, 271–296. [\[CrossRef\]](#)
58. Ten Cate, O.; Durning, S. Peer teaching in medical education: Twelve reasons to move from theory to practice. *Med. Teach.* **2007**, *29*, 591–599. [\[CrossRef\]](#) [\[PubMed\]](#)
59. Wood, D.; Bruner, J.S.; Ross, G. The role of tutoring in problem solving. *J. Child Psychol. Psychiatry* **1976**, *17*, 89–100. [\[CrossRef\]](#)
60. Zaretskii, V.K. The Zone of Proximal Development. *J. Russ. East Eur. Psychol.* **2009**, *47*, 70–93. [\[CrossRef\]](#)
61. Cohen, S.; Wills, T. Stress, social support, and the buffering hypothesis. *Psychol. Bull.* **1985**, *98*, 310–357. [\[CrossRef\]](#)
62. Hogan, B.E.; Linden, W.; Najarian, B. Social support interventions: Do they work? *Clin. Psychol. Rev.* **2002**, *22*, 381–440. [\[CrossRef\]](#)
63. Cutrona, C.E.; Troutman, B.R. Social support, infant temperament, and parenting self-efficacy: A mediational model of postpartum depression. *Child Dev.* **1986**, *57*, 1507–1518. [\[CrossRef\]](#)
64. Hickey, A. The baby group: Charting the typologies of a parental community of practice. *Leis. Stud.* **2019**, *38*, 480–493. [\[CrossRef\]](#)
65. Herwig, J.E.; Wirtz, M.; Bengel, J. Depression, partnership, social support, and parenting: Interaction of maternal factors with behavioral problems of the child. *J. Affect. Disord.* **2004**, *80*, 199–208. [\[CrossRef\]](#)
66. Goddard, M.E.; Beilharz, R.G. Genetic and environmental factors affecting the suitability of dogs as Guide Dogs for the Blind. *Theor. Appl. Genet.* **1982**, *62*, 97–102. [\[CrossRef\]](#) [\[PubMed\]](#)
67. Takeuchi, Y.; Kaneko, F.; Hashizume, C.; Masuda, K.; Ogata, N.; Maki, T.; Inoue-Murayama, M.; Hart, B.L.; Mori, Y. Association analysis between canine behavioural traits and genetic polymorphisms in the Shiba Inu breed. *Anim. Genet.* **2009**, *40*, 616–622. [\[CrossRef\]](#) [\[PubMed\]](#)
68. Salman, M.D.; Hutchison, J.; Ruch-Gallie, R.; Kogan, L.; New, J.C.; Kass, P.H.; Scarlett, J.M. Behavioral reasons for relinquishment of dogs and cats to 12 shelters. *J. Appl. Anim. Welf. Sci.* **2000**, *3*, 93–106. [\[CrossRef\]](#)
69. Weiss, E.; Greenberg, G. Service dog selection tests: Effectiveness for dogs from animal shelters. *Appl. Anim. Behav. Sci.* **1997**, *53*, 297–308. [\[CrossRef\]](#)
70. Wilsoson, E.; Sundgren, P.E. The use of a behaviour test for selection of dogs for service and breeding. II. Heritability for tested parameters and effect of selection based on service dog characteristics. *Appl. Anim. Behav. Sci.* **1997**, *54*, 235–241. [\[CrossRef\]](#)
71. Asher, L.; Blythe, S.; Roberts, R.; Toothill, L.; Craigon, P.J.; Evans, K.M.; Green, M.J.; England, G.C.W. A standardized behavior test for potential guide dog puppies: Methods and association with subsequent success in guide dog training. *J. Vet. Behav.* **2013**, *8*, 431–438. [\[CrossRef\]](#)

72. Svartberg, K.; Forkman, B. Personality traits in the domestic dog (*Canis familiaris*). *Appl. Anim. Behav. Sci.* **2002**, *79*, 133–155. [[CrossRef](#)]
73. Jones, A.C.; Gosling, S.D. Temperament and personality in dogs (*Canis familiaris*): A review and evaluation of past research. *Appl. Anim. Behav. Sci.* **2005**, *95*, 1–53. [[CrossRef](#)]



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Supplementary Material

Table S1. Interview schedules for puppy raisers and staff.

Puppy raiser participants	Staff participants
<i>General questions</i>	
- How many puppies have you raised so far?	- N/A
- Tell me what it's like to be a puppy raiser.	
- How would you compare your everyday life when raising your first puppy with your life before that?	
- How would you compare the practice of raising an assistance dog puppy with raising a pet puppy?	
<i>Motivations and expectations</i>	
- What motivated you to become a puppy raiser in the first place?	- What motivates people to become puppy raisers?
- What were your expectations when you commenced the program?	- What is required of a raiser to raise a successful puppy?
- (If participants have raised more than one puppy), what motivated you to continue the practice of puppy raising?	- Why do some raisers decide to raise another puppy, and others don't?
- (If participants have raised more than one puppy) How would you compare your experience raising your first puppy with your experiences with subsequent puppies?	
<i>Insights</i>	
- What do you think contributes to raising a successful puppy?	- What contributes to raising a successful assistance dog puppy?
- What is required of you, and what are the ideal conditions for you to successfully raise an assistance dog puppy?	- What are the ideal conditions to successfully raise an assistance dog puppy?
<i>Challenges</i>	
- Tell me about any challenges that you encountered.	- What kind of challenges do raisers commonly encounter?
- How did those difficulties affect your practice or the outcomes of your raising practice?	- What do they do in those situations?
- What could've been done differently to eliminate those impacts?	- What do you or [your organisation] do in those situations?
<i>Puppy issues: health, behavioural issues</i>	
- Did you experience any health or behavioural issues when raising your first puppy?	- What are the issues that first-time raisers commonly have with their puppies?
- Tell me what you felt when you encountered those issues	- What do they usually do to respond to those situations?
- What was your approach when the issue first happened?	- How about experienced raisers?
- What did you do to search for a solution?	
- Would you handle the situation differently now that you have had more experience?	

Table S1. Interview schedules for puppy raisers and staff (Cont.)

Puppy raiser participants	Staff participants
<i>Training and engagement</i>	
<i>Knowledge</i>	
<i>Organisational supports</i>	
<i>Responsibility/workload</i>	

Further Discussion

This chapter aimed to explore factors affecting raiser practices and their PR experiences. Overall, the findings in this chapter confirmed several components of the general PR model (refer to Figure 2.1) proposed in Chapter 2. This model outlined a hierarchy of factors (i.e., theoretical, organisational, and raiser-individual levels) that may influence puppy behaviour. The current findings extended on the model by suggesting bidirectional relationships between factors at different levels and additional support sources, and by considering the emotional function of support for the raisers.

Specifically, the current findings confirmed the relevance of several factors at the theoretical, organisational, and individual levels. For instance, a staff member (S13) mentioned the exclusive use of positive dog training techniques in their PR program, a method appraised in the dog training literature as necessary for achieving good animal welfare (Todd, 2018). This suggests a relationship between theory-level factors, such as theoretical recommendations, and organisation-level factors, such as choices of dog training methods. Organisations then provided their raisers with instructions, training, and support in various forms, which reflects the influences of organisation-level factors on raisers' specific practices. Although puppy behaviour was not measured in this study, the raisers reported developing knowledge and skills to handle their puppies more effectively. Considering that fearfulness, an undesirable trait amongst ADs, can be minimised with careful management of puppy socialisation, an improvement in raisers' competency implies potential benefits for their puppies. These top-down influences from theoretical to organisational to individual levels of factors, were in line with the general PR model presented in Chapter 2.

The current findings further suggested a reversed direction of influences for factors at those three levels – bidirectional relationships that were not considered in the general PR model. Specifically, raisers reported having positive experiences when raising easy-going

puppies. Puppy characteristics appeared to influence how demanding the raisers' perceived their practices to be. Although the raisers received instructions from program providers, they took the liberty to decide how those instructions were interpreted in their at-home PR practices. For instance, one staff member (RS10) raised concern over raisers' conduct against the program's rules and restrictions. Another participant, S13, shared difficulties encountered when instructing raisers whose pre-existing dog training methods contradicted those endorsed by the organisation. Furthermore, puppy raisers were also active recipients of organisational support: the raisers' help-seeking behaviours determined the type and extent of support they received. Thus, the reversed direction of influences suggests bidirectional relationships between factors at one level and the next within the throughput stage of the general PR model: theoretical, organisational, individual, and puppy levels (refer to Figure 2.1).

Besides support from the raisers' family, friends and workplace colleagues, the findings regarding the emotional function of the organisation's support were additional to the features proposed in the general PR model. Emotional support from those sources related to the raisers' experiences and helped the raisers go through difficult times, as well as helping them to keep improving their puppy's behaviour. Since emotional support was relevant to both the raisers' experiences and the puppies' training progress, this support function opens a new dimension for other support sources typically associated with technical support, such as professional dog trainers. In short, findings in this chapter supported the general PR model and suggested additional features be added to this framework, namely bidirectional relationships and the emotional support.

Chapter Summary

As informed by the general PR model proposed in Chapter 2, this chapter presented a published study exploring factors affecting the PR practices and experiences of volunteer raisers. With a focus on improving the raisers' practices, but also potentially relevant to the

puppies' training outcomes, as proposed in the general PR model, this qualitative study included experienced raisers and staff from programs in different countries. The study revealed factors specific to the individual raisers, different sources and functions of social supports, and puppy characteristics. The findings also suggested additional features for the general PR model described in Chapter 2. The findings in this chapter were directly relevant to the raisers' practices and program experiences, and potentially influential on puppies' raising outcomes (i.e., puppy behaviour) via the proposed bidirectional relationships of those factors. Therefore, it is helpful to examine which of these factors would be the best predictors of perceived puppy behaviour. This approach will ensure that the predictors of puppy behaviour are also relevant to the raiser' experiences.

Chapter 4:
Examining Predictors of Puppy Behaviour

Chapter Overview

This chapter aimed to examine predictability of perceived puppy behaviour from various factors identified in Chapter 3 and the structure of their relationships. Past research obtained mixed results when predicting AD behaviours from ‘nature’ factors, such as breed, sex, and early puppy characteristics (Asher et al., 2013; Takeuchi et al., 2009), or from PR program designs (Batt et al., 2008; Vaterlaws-Whiteside & Hartmann, 2017). Therefore, the approach in this chapter was to include raiser-level factors when predicting perceived puppy behaviour, as informed by the hierarchy of factors in Chapter 2, in which raiser practices would directly relate to puppy behaviour.

A questionnaire was developed, which included 16 items aimed to measure raisers’ perceived competency, perseverance and passion, and their help-seeking behaviours – the themes that were identified in Chapter 3. Some items were related to raiser practices, such as puppy training (e.g., *‘I never give in to my puppy when s/he does what s/he is not allowed to’*) and puppy socialisation (i.e., *‘I take my puppy to many different public places e.g., shopping centres, cafes, events’*). Contextual factors were also considered potential predictors, including several PR support types representing organisational and general social support available to the puppy raisers. These contextual factors were expected to relate to puppy behaviour indirectly but to directly relate to the raiser-level factors.

The following section presents a study published in *Applied Animal Behaviour Science*, titled ‘Socialisation, training, and help-seeking—specific puppy raising practices that predict desirable behaviours in trainee assistance dog puppies.’ In this study, 231 puppy raisers (205 women, 25 men, one undisclosed; aged between 18 and 79 years old) from seven countries (mostly the United States) completed an online survey. The survey asked raisers’ demographic details, ratings of their puppy’s behaviour, their raising practices, and perceived helpfulness of various sources of support. A principal component analysis returned three

clusters of items, namely Socialisation, Training, and Help-Seeking Behaviour, from the 16-item raisers' practices questionnaire. Stepwise regression analyses suggested that Socialisation and Training variables appeared in the best models, predicting five out of six measures of perceived puppy behaviour. Apart from puppy sitters, other types of organisational support did not predict any puppy behaviour. Support from mentors was the only factor that predicted raisers' socialisation and training practices, but the raisers' help-seeking behaviour mediated those relationships. This chapter then further discusses the findings in relation to the general PR model and the findings in Chapter 3.

**Paper 3: Socialisation, Training, and Help-Seeking—Specific Puppy Raising Practices
that Predict Desirable Behaviours in Trainee Assistance Dog Puppies**

Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2021b). Socialisation, training, and help-seeking—specific puppy raising practices that predict desirable behaviours in trainee assistance dog puppies. *Applied Animal Behaviour Science*, 236, 105259.
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The online survey questionnaire of this study is presented in the Appendix.

This publication has been redacted due to copyright restrictions

Further Discussion

This chapter was informed by the general PR model presented in Chapter 2 and the influencing factors emerging in Chapter 3. Specifically, this chapter aimed to explore the best predictors of puppy behaviour from raiser-specific and contextual factors. Overall, the findings confirmed the logic proposed in the general PR model, in which raisers' practices, rather than organisational support, would have direct relationships with raiser-rated puppy behaviour. Support from mentors, a contextual factor, was predictive of raisers' socialisation and training practices – relationships which were mediated by the raisers' levels of help-seeking behaviour. None of the other contextual factors were predictive of the raisers' practices. However, raisers' higher ratings of perceived support from puppy sitters and from external dog trainers, respectively, predicted lower (favourable) and higher (undesirable) raiser-rated levels of excitability in puppies.

The findings regarding the predictability of puppy behaviour from raiser-level factors could explain mixed results in past research. Specifically, past research could not reliably predict AD behaviour from puppies' early behavioural profiles, breed, or sex (Asher et al., 2013; Asher et al., 2017; Goddard & Beilharz, 1982; Vaterlaws-Whiteside & Hartmann, 2017). Although those factors were not included in this chapter, raiser practices could predict puppy behaviour on top of and beyond puppy age. When predicting puppy behaviour from 'nature' factors, such 'nurture' factors as the raisers' practices were evident as confounding factors, which have not been controlled for or even accounted for in past research on the predictability of puppy behaviour.

The findings regarding non-significant predicting effects of formal organisational support (e.g., AD trainers) were in line with Batt et al. (2008). Batt et al. (2008) found no significant improvement in graduating rates of puppies in two treatment groups where raisers received structured training and socialisation programs, compared to a control group which

received an existing program in which raisers were encouraged to socialise their puppies and seek help when they needed it. There was no reported restriction in Batt et al. (2008) regarding raisers' ability to interact with and learn from each other, or from other experienced members within their organisations. Batt et al (2008) suggested that a possible reason why there was no observed difference between groups was due to minimal effects of puppy socialisation only on puppies' trainability, and not on their fearfulness and sensitivity when encountering novel situations (Seksal et al., 1999, as cited in Batt et al., 2008). However, it might also be that the benefits of informal support, to which all raisers likely had equal access, outweighed any effect of formal support in the two treatment groups. This explanation appears plausible since the current study showed that informal support from experienced raisers, or mentors, predicted higher ratings of raiser socialisation and training practices, effects which were absent from other sources of formal support. Even so, neither dog trainers' nor mentors' support in the current study predicted puppy behaviour. These findings not only further explain Batt et al.'s (2008) findings, but also partly confirmed the hierarchy of factors proposed in the general PR model in Chapter 2, in which any effects from organisation-level factors should be directly on raiser-level factors rather than on puppy behaviour.

Support from puppy sitters was predictive of puppy behaviour. In PR, program providers typically arrange support from puppy sitters and these were not general puppy sitters, such as the raisers' family members or friends. To my knowledge, puppy sitters have not been considered in the AD literature as having any potential benefit to PR outcomes, apart from the convenience of their temporary support, which allows raisers to have short breaks from their long-term PR duties. Arrangements for short-term puppy sitting, as one source of contextual support for puppy raisers, may not be available at some organisations. However, whenever this support is available, it would be reasonable to expect some effect on

puppy behaviour, since these individuals also directly interact with and manage the puppies, even if only on a short-term basis. This partly confirms the logic in the general PR model, in which individual-level factors would be expected to have direct influences on puppy behaviour. The term ‘individual-level’ in the general PR model originally referred only to puppy raisers, though the current findings suggest incorporating any individuals who share PR practices with puppy raisers and directly manage the puppy during this period.

Chapter Summary

This chapter aimed to examine which of the factors found in Chapter 3 would best predict raiser ratings of puppy behaviour. The findings supported the general PR model, in which raisers’ practices were proposed to be the best predictors of puppy behaviour, along with the behavioural benefits associated with puppy sitters, individuals arranged by program providers to manage and interact with the puppies on a short-term basis. This addition further reinforces the notion that individual-level factors, socialisation and training practices, rather than organisation-level factors, would better predict puppy behaviour. Of the contextual factors, only support from mentors (i.e., experienced puppy raisers within the program) appeared to promote raisers’ help-seeking behaviour, which mediated how the raisers’ practices benefited from this type of support.

The findings in this chapter fully supported the hypothesis H₁ in this thesis (refer to Chapter 1) in which raisers’ practices significantly predicted puppy behaviour. This hypothesis was proposed on the basis that raisers were directly responsible for puppies’ early learning and socialisation experiences. Since this hypothesis was concerned with the broader scope of this thesis, support for this hypothesis has implications beyond the focus of the current chapter (i.e., predictors of puppy behaviour). This helps narrow the investigation in Chapter 5 specifically to exploring factors promoting and hindering raisers’ engagement in recommended PR practices, the significant predictors of puppy behaviour.

Chapter 5:

Factors Affecting Raisers' Engagement in Recommended Practices

Chapter Overview

So far in this thesis, Chapter 2 reviewed existing literature in AD research and proposed a general PR model with a hierarchy of factors affecting puppy behaviour. Findings in Chapter 3 suggested revision to the general PR model by incorporating more features (i.e., bidirectional relationships and different sources and functions of contextual support). The findings in Chapter 4 somewhat supported the general PR model, but suggest extending the individual level to any individuals who directly manage the puppies' experiences and learning, such as puppy sitters. Chapter 4 concluded the exploratory stream of the research model depicted in Figure 1.1.

This chapter represents the parallel stream in the mixed-methods model, with a longitudinal qualitative study focusing on raisers' program outcomes. Specifically, the study in this chapter adopted a constructivist approach to understanding the experiences of first-time puppy raisers, focusing on characterising facilitators and barriers to their engagement in recommended practices. Although the study in this chapter was conducted simultaneously with the research presented in Chapters 3 and 4, data analyses in the current study took place when most findings in that exploratory sequence were available. Therefore, data analysis in this study adopted a theory-driven approach, as it allows for a narrow and focused analysis of qualitative data. Literature on working dogs, a higher-order category that includes ADs, suggested three recommended PR practices relevant to the three raiser-practice constructs identified in Chapter 4, namely raisers' Socialisation Practices, their Training practices, and raisers' Help-Seeking Behaviour. Thus, the three recommended PR practices selected for data analysis in this chapter included frequent socialisation, consistent training, and raisers' effective ongoing learning.

The following section presents a study published in *Animals*, titled "Facilitators and barriers to assistance dog puppy raisers' engagement in recommended raising practices." In

this longitudinal qualitative study, I followed eight puppy raisers from a PR program based at a La Trobe University campus in Bendigo, a regional city of Australia. An independent assistance dog organisation was responsible for all aspects of this program, such as screening and selecting prospective raisers from the La Trobe University community, puppy placements, weekly training, and meeting all expenses associated with raising the puppies. Interviews with the raisers took place monthly until they returned their puppy. Sixteen interviews were pseudo-randomly selected for analysis, revealing several facilitators and barriers to the raisers' engagement in frequent socialisation, consistent training, and effective ongoing learning. This chapter then discusses the relevance of the current findings to the previous chapters.

Paper 4: Facilitators and Barriers to Raisers' Engagement in Recommended Assistance**Dog Puppy Raising Practices**

Mai, D., Howell, T., Benton, P., Lewis, V., Evans, L., & Bennett, P. C. (2021c). Facilitators and barriers to raisers' engagement in recommended assistance dog puppy raising practices. *Animals*, *11*(5), 1195. <https://doi.org/10.3390/ani11051195>

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Article

Facilitators and Barriers to Assistance Dog Puppy Raisers' Engagement in Recommended Raising Practices

Dac Mai ^{1,*} , Tiffani Howell ¹ , Pree Benton ², Virginia Lewis ³, Lynette Evans ⁴ and Pauleen C. Bennett ¹ 

¹ Anthrozoology Research Group, Department of Psychology and Counselling, School of Psychology and Public Health, La Trobe University, Flora Hill, VIC 3552, Australia; T.Howell@latrobe.edu.au (T.H.); Pauleen.Bennett@latrobe.edu.au (P.C.B.)

² Centre for Service and Therapy Dogs Australia, Melbourne, VIC 3162, Australia; Pree.Benton@dogsforlife.com.au

³ Australian Institute for Primary Care and Ageing, La Trobe University, Bundoora, VIC 3086, Australia; V.Lewis@latrobe.edu.au

⁴ School of Psychological Science, La Trobe University, Bundoora, VIC 3086, Australia; L.Evans@latrobe.edu.au

* Correspondence: Jimmy.Mai@latrobe.edu.au; Tel.: +61-035-444-7317

Simple Summary: Raisers volunteer to raise and manage an assistance dog puppy for about a year and typically receive instructions for a wide range of puppy raising tasks from a host organisation. Those tasks vary among organisations, although the literature suggests that raisers should provide frequent socialisation and consistent training to their puppy, and engage in effective learning to improve their own practices. As those tasks are heavily embedded in the raisers' daily lives, it is not easy to determine if any factors could affect their puppy raising. In this study, we interviewed eight puppy raisers monthly during their participation in an 11-month puppy raising program based at a university campus. Raisers thought that their puppies received more socialisation when they had more availability or someone else to share this responsibility with them, or when the puppies behaved well. Raisers could train their puppy more consistently when they had been prepared to deal with different scenarios occurring during their daily activities. While raisers found that some learning methods suited them better, they generally appreciated opportunities to learn, seek help from, and practise with other raisers. We hope these findings will inform development and evaluation of future programs aimed at improving practices and experiences of raisers.



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Abstract: Many assistance dog providers use volunteer raisers to manage each puppy's learning and daily experiences, which partly determines the puppy's behavioural development. Therefore, it is important that raisers engage in recommended practices. Three common recommendations from the literature include frequent socialisation and consistent training for the puppies, and effective training for the raisers. However, what facilitates or hinders raisers' engagement in these practices remains unclear. To understand this, we interviewed eight raisers (three men and five women) every month during their year-long puppy raising program, and pseudo-randomly selected 16 from 48 interviews for data analysis. Thematic analyses revealed several facilitating and/or hindering factors corresponding to each of the three recommended practices. Frequent socialisation was influenced by the raisers' availability, sharing of puppy raising responsibility with others, support from their workplace, and the puppy's behaviours (e.g., soiling indoors, jumping). Consistent training was challenged by the presence of everyday distractors, accessibility to timely advice, perceived judgement from others, and the puppy's undesirable behaviours. Effective learning was facilitated by having information available in raisers' preferred learning modality, opportunities for peer-learning, and willingness to seek help. Future research should examine these factors quantitatively, which will enable more robust evaluation of programs aimed at supporting puppy raisers.

Keywords: service dog; guide dog; puppy raising; puppy socialisation; dog training; organisational support; social support; puppy raiser; puppy walker; puppy foster carer

1. Introduction

The assistance dog industry provides certified dogs who are healthy and well-trained, to accompany and assist a human handler, certain aspects of whose daily functioning are affected by a disability, to live more independently [1,2]. The process of training and certifying assistance dogs normally begins with breeding and selecting puppies with suitable traits, then placing them with a volunteer who raises the puppy and assists the assistance dog provider by undertaking the many tasks required to produce well-rounded adult dogs [3–6]. As puppies need to be house-broken and socialised, a production model where puppies grow up in kennels is not appropriate for their welfare and learning objectives. Therefore, providers often rely on volunteer raisers to provide a safe home for the puppy's first year of life, while the puppy begins early socialisation and training. At the end of this process, about half of the dogs do not become assistance dogs, mostly because their temperament and performance do not meet the industry's strict criteria for skill competency and public safety [7–9]. Understanding why only some dogs succeed is key to optimising production.

It is well established that both nature and nurture drive the development of personality and behavioural patterns [10]. In a critical review, Mai et al. [11] argued that while research has focused on nature factors (i.e., selecting puppies with sound temperaments), very little is known about how management of a puppy's learning and their experiences during their stay with the raiser affect success. During the puppy raising program, puppies navigate through their puppyhood, juvenile, and young adulthood stages [12–14]. Throughout this time, they are not socially mature, a neurological and developmental outcome which normally occurs when dogs are two to three years old [15–19]. The developmental process can be challenging and includes sensitive periods in which puppies are particularly fearful and susceptible to various stimuli [13,15,20–22]. This means that experiences during this time, and, in particular, the training approach used by those responsible for the puppy's care, may be very influential. Literature is beginning to emerge which demonstrates better outcomes for companion dogs trained using primarily positive reinforcement relative to other approaches [22–25]. Without going into detail about the effectiveness of different dog training techniques, Mai et al. [11] asserted that, regardless of how puppies are bred or what policies and procedures are employed by the organisations that produce them, a critical link in understanding outcomes for individual puppies is knowing more about the practices actually engaged in, on a day-to-day basis, by those who raise them. At most, organisations can indirectly influence outcomes by affecting the practices engaged in by raisers, practices that are likely to also reflect many other influences. It is the raisers' practices (including training and socialising practices) that are most likely to have direct influences on puppy behaviour, an assertion that was later supported by Mai et al. [26].

While raisers' practices may be expected to have direct influences on puppy behaviour during critical developmental stages and beyond [26], only a small number of studies have focused on puppy raisers [3–6,26]. These typically did not specifically examine raisers' practices but investigated puppy experiences. For instance, Chur-Hansen et al. [4] interviewed puppy raisers and subsequently raised concerns about the experiences of first-time raisers from one program. This study revealed several challenges, such as a lack of proper preparation, demanding workload, struggling with puppy training, experiencing negative emotions, and reduced motivation. Mai et al. [3] interviewed experienced raisers and staff from different organisations to explore factors thought to be associated with successful puppy raising. These helping factors included raisers' personal attributes (e.g., competency and motivation), the availability of external supports (e.g., organisation's technical instructions, emotional support from other raisers), and the nature of the puppy being raised. What raisers should do to help with the progress of their puppy and what factors could facilitate or hinder their engagement in those practices remains unknown.

Several reviews [22,27,28] and associated industry reports [29] concerning best practices in rearing and training of working dogs in other contexts (e.g., racing, herding, sledding) have highlighted common practices along with recommendations to enhance

dog welfare and ensure better performance outcomes. These include careful management of the puppy's learning and their exposure to stimuli likely to be present in their adult environment, and appropriate education, training and support for their trainers and handlers [22,27–29]. Although assistance dogs perform different roles than dogs working in these other contexts, the same recommendations for effective puppy raising practices are likely to be relevant.

Of critical importance is the process of socialisation, i.e., providing puppies with opportunities to familiarise themselves with and become desensitised to everyday living situations that they will likely encounter during their working life [13,22,30]. For livestock guarding dogs, this will include exposure to farm personnel and stock. For racing greyhounds, this will include exposure to the track, the lure, and other dogs. For assistance dogs expected to spend their adult lives working closely with humans, this might include appropriately supported exposure to public transport, shopping centres, crowded outdoor markets, and small children. Important also is training puppies to perform appropriate behaviours or life skills, e.g., walking on a leash, following commands for sit, down, and wait [27,28]. It is reasonable to suggest that many of these should be taught during the socialisation process, as the puppies will be required to perform specific learned behaviours in various environmental settings and in the presence of many distractions.

A third critical practice to emerge from the working dog literature is for the puppy trainer or, in this current context, puppy raisers, to engage in ongoing education and training [27,29]. The effects of raisers' acquisition of knowledge and skills on their puppies' outcomes are not well documented except for a few tentative suggestions for improving raisers' competency derived from qualitative research [3,4] and unpublished doctoral research [31]. While raisers may take time to gain experience and develop their competence before acquiring a puppy, engaging in professional development such as learning new knowledge and skills throughout the puppy raising process is an essential practice. Therefore, raisers' engagement in effective ongoing learning appears to be instrumental to raising successful puppies [27,29].

In brief, there is currently no consensus on standards for best practices in puppy raising in the assistance dog literature. However, recommendations from working dog research provide a potential framework for guiding research in this area. Based on the available literature, we contend that puppy raisers should be encouraged to engage in frequent socialisation and consistent training for their puppy, and effective continuous learning for themselves. To identify facilitators and barriers to engagement in these recommended puppy raising practices, we conducted interviews with staff and students who were participating as puppy raisers in an assistance dog raising program conducted within a university community. We had no control over the program the raisers were participating in and did not observe it in any detail. Therefore, we are unable to describe the level of advice provided or even the style of training used. Our intent was not to evaluate this program or to compare it with others, but to identify facilitators and barriers to practice that may then act as evaluative criteria for future program evaluation research.

2. Materials and Methods

2.1. Participants

A total of eight (3 men; 5 women) La Trobe University (LTU) community members participated in the current study. There were five students and three full-time staff whose ages ranged from 20 to 64 years old. All had volunteered in a campus-based puppy raising program run by an independent assistance dog provider. The staff held various non-academic positions, while the student participants were enrolled in either undergraduate or postgraduate courses. At the time of recruitment, the length of their affiliation with LTU was between six months and 10 years, with most around three years. The inclusion criteria for the current study included being 18 years or older and students or staff at the LTU campus in Bendigo, a city which is located in regional Victoria, Australia, with a population of around 150,000 as of 2016 [32]. There were no predetermined exclusion criteria in our

study, although the decision to enrol an interested applicant into the puppy raising program remained with the program providers, based on their assessment of whether the participant could provide a safe home conducive to socialisation and training. While some participants had prior experiences with their family dogs and puppies, none had raised an assistance dog puppy before.

2.2. Materials

The interviews followed a semi-structured schedule (see Table S1) which focused on various aspects of the participant's engagement with the program. The schedule was developed by experienced members of our research group in consultation with the organisation conducting the puppy raising program, and it was piloted on other members of the research group with puppy-raising experience. This process resulted in a schedule that was less prescriptive than initially planned. During their puppy raising, we asked the raisers to share their recent experiences in the puppy raiser role as well as feedback about the program's design and operation. For these progress interviews, we started the conversations with the simple request of *"Tell me about your experience with puppy raising during the last month"*. We then sought further elaboration on the raisers' experiences and identification of any issues that affected their experiences as puppy raisers or the puppy's training progress. Since this was a longitudinal study, we also asked the raisers in subsequent interviews if there had been any changes in relation to the experiences that they previously reported.

2.3. Procedure

The puppy raising program and associated study were advertised to LTU community members via internal email distribution and official media and communication channels. Interested staff and students received an information package. Upon receipt of a signed consent form, they were invited to an initial interview about their motivations, expectations, and perceived suitability. These individual factors are program-independent and were already investigated in Chur-Hansen et al. [4] and Mai et al. [3]. Therefore, data from these initial interviews were not included in the current study as they were beyond the scope of this study. After the interview, the applicant's contact details were forwarded to the assistance dog program provider for a suitability assessment, which was conducted as per their existing procedure. Participants who were deemed suitable for puppy raising by the provider received their puppy between February and April 2019. All puppies were selected by the assistance dog provider for inclusion in the program, and all were female (six Labrador Retrievers, two Lagotto Romagnoli). Each participant raised one assistance dog puppy at a time, for approximately one year.

The experienced program provider was responsible for all operations of the puppy raising program, such as arranging for health checks and veterinary care, describing training protocols and meeting costs associated with raising and training the puppies. This organisation provided necessary equipment to ensure the raisers could meet the puppy's needs. Group training sessions ran weekly and took place on campus and in local shopping centres. During those sessions, trainers also discussed any concerns the raisers had in their puppy raising. Trainers were also available to provide support by phone as required.

Participants were interviewed at the end of their first week in the program, except for one participant, Adrian (participant's pseudonym), who was unavailable until the end of the second week (see Table 1). Progress interviews took place every month, either in person or via teleconference, until each participant relinquished their puppy back to the organisation for advanced training. With the participants' consent, de-identified information from the interviews was sometimes used to suggest program improvements to the provider. It was deemed ethically irresponsible not to share this information, given that it could affect outcomes for the puppies in the program or their eventual handler with a disability. Part of the rationale for raising puppies in a university environment was to enlist

raisers in working directly with the provider to improve the operations of the program, either directly or indirectly via de-identified feedback provided via the research team.

Table 1. Length in the program at the time of interviews included in data analysis.

Raisers' Pseudonym	Weeks Since Arrival of Puppy	
	Transition Interview	Progress Interview
Adrian	2	4
Edwin	1	5
Wesley	1	16
Fiona	1	20
Jane	1	21
Veronica	1	26
Harriet	1	35
Kate	1	40

During the program, a total of 48 interviews were conducted all by the first author (D.M.). These were audio-recorded, with lengths ranging from 11 to 63 min and an average of 28 min. With recurring cross-sectional data collection (i.e., at different time points), the current study resembles a longitudinal qualitative study by its design though not by its theoretical approach [33]. Thomson et al. [33] argue that a longitudinal study by default should consider both the emergence of themes at each time point (synchrony) and their changes through time (diachrony). Instead, the current study's aim related more closely to that of a cross-sectional (i.e., identifying emerging themes) than a longitudinal study (i.e., focus on changes in emerging themes through time). For this reason, data were analysed for all participants at the transition stage, but we then randomly selected one progress interview per participant (see Table 1) for analysis. This method enabled us to capture their collective experiences at various stages (i.e., synchronically) from four weeks to 40 weeks in the program, but without going through all data collected each month, which would reflect a diachronic approach and was beyond the scope of the project. Recordings of the 16 selected interviews were transcribed and analysed using NVivo 12 [34].

2.4. Data Analysis

Data were analysed in two stages. The thematic analysis took place in Stage One, which adopted an inductive approach that allowed themes to emerge from the data [35]. During this stage, the first author thematically coded the data as per Braun and Clarke [36] separately for the transition and the progress interviews. In Stage Two, those themes were discussed among four authors (D.M., T.H., P.B., and P.C.B.) in several meetings to retain the themes that were relevant to the three recommended practices derived from the existing literature, namely providing puppies with sufficient socialisation and consistent training, and raisers' adoption of effective learning strategies. This sequence allowed for an in-depth exploration of the data (Stage One), which is generally appraised as a strength of qualitative methodology [35], while ensuring the findings were specific to the research questions (Stage Two). The second stage reflects a theory-driven approach to analysing qualitative data in program implementation research, which highlights the advantages of applying categorisations of factors and their relationships from established theories and frameworks [37–40]. In the current study, we based our three main categorisations on literature reviews on recommended practices in the working dog industry [22,27,29].

For each emerging theme, direct quotes are provided to give voice to the raisers and to characterise the influences that those factors had on the raisers' engagement in the corresponding recommendations. The quotes were sent back to each participant for member checking. Commonly spoken filler words such as "uh" and "erm", were removed from the quotes. Where appropriate, to aid readability, square brackets with the ellipsis (i.e., [. . .]) indicate an omission of irrelevant responses. Square brackets may also contain a

word or a phrase to replace identifiable details or grammatical errors. Parentheses provide explanations or essential contexts for the quotes.

3. Results

This section describes factors affecting raisers' engagement in practices recommended for their puppy raising, namely frequent socialisation, consistent training, and effective learning.

3.1. Frequent Socialisation

In the current study, raisers took their puppy with them to work or study activities at the university campus. Those activities took place in classrooms, lecture theatres, offices, meeting rooms and sports fields, and in the university cafeteria, library and student lounge. Some student participants lived on campus, so their puppy was exposed to the campus student residences. Participants also travelled with their puppy to public places outside of the campus, such as shopping centres, restaurants, and on public transport. To ensure their puppy could meet with people of different ages and appearances, some puppy raisers proactively contacted and arranged puppy events at local primary schools and attended festivals on campus, while other raisers received various visitors to their office as part of their regular operations. Overall, puppies accompanied their raiser to places for reasons ranging from personal to professional. The frequency of those opportunities varied amongst raisers and was dependent on individual factors, as described below.

3.1.1. Puppy Behaviour

Socialising the puppies occurred either as planned trips or during spontaneous travel, when they accompanied their raiser to various places. In both cases, how the puppy generally behaved during those occasions determined the convenience of their presence and the raiser's willingness to take the puppy with them on subsequent trips. Problematic issues included, but were not limited to, soiling indoors, barking, jumping, and pulling on the leash. When discussing raisers' motivation, we referred to a ten-point scale, with ten being highly motivated to take the puppy out on spontaneous trips. Veronica responded:

If she has not gone to the toilet, if she just refuses to go, two (out of 10 on motivation). Honestly, I have left her in the car [while I quickly run in] because I just [did not] want to deal with it. The last thing I want is for her defecating in a fresh food aisle. You do not want that near food. It is disgusting and it makes me look bad. It makes me look like I do not take the dog to the toilet often enough. I have had it three times and I'm over it. People look at me funny and I just hate it. (Veronica)

Although puppies' toileting issues appeared to be inconvenient for raisers in most public places, because of official acknowledgement of the puppies' presence on campus, some toileting accidents that happened on campus at the beginning of the program were able to be openly communicated with relevant personnel, and raisers were then reassured that such behaviours were expected. That helped improve campus accessibility. However, raisers' experiences remained less positive when their puppy exhibited inappropriate toileting behaviours in other public places. For other raisers, puppies' behavioural issues such as leash pulling posed a safety concern. As Kate explained:

Her major problem is such high excitement levels around animals, especially dogs, that she lunges. She is so strong that if she lunges, she can pull me over or really injure me. It became almost a medical issue for me taking her out somewhere where there are dogs. She can really hurt me quite easily without realising it, because I do have back problems. If she goes, she could really easily mess something up. (Kate)

While some puppies were comfortable with handling when given to raisers, others took time to improve. As the puppies improved, the socialising experiences became less stressful for both the puppy and their raiser. On some occasions, the improvement reflected the joint efforts of the raisers and the program providers to address puppies' undesirable

behaviours in public places. On other occasions, improvements were probably a reflection that the puppies' behaviour was changing as they matured. For instance, Jane shared the following improvement:

She has matured a lot over the last few months and gotten a lot easier to handle. She is a lot calmer once I put the vest on her and she settles in a lot quicker. When I take her to lectures, it used to take her five minutes or so to settle down and just sit there but now she'll come in, we'll sit down and by the time I've got my books out, she's lying down underneath the desk and just knows that that's what she has to do. (Jane)

3.1.2. Raisers' Other Commitments

Raisers in the current study had work and study commitments that at times made the socialisation of their puppy inconvenient. For instance, Veronica described that:

I have a tight schedule for some days. If I have a huge assignment due, [. . .] then my motivation will be down to bring her to the shopping centre because it takes double the time to get anywhere with her. That is just the way it is, and yes, her toilet schedule. Just schedules. Toilet schedule and my schedule that is it. It is a time-sensitive thing and a toilet-sensitive thing. Other than that, then I would take her in [to the supermarket]. (Veronica)

At times, the high workload from other commitments required raisers to evaluate the necessity of allowing the puppy to accompany them, which would provide their puppy with socialisation and also extend the planned trips; sensitive time management was an essential skill.

3.1.3. Supplementary Supports

Raisers in the current study were either staff or full-time students with part-time employment. Although they could bring the puppy to the university in their office or classrooms, many required additional supports for their puppy's socialisation. For this reason, some additional socialisers were recruited and trained by the assistance dog provider overseeing the program. These were students or staff who signed up to volunteer a few hours per week to take a puppy out and socialise her. Family or other household members were also called upon to provide additional support. During days when raisers were at work or studying, they might ask their socialisers to pick up the puppy for a walk and to give her some training. Edwin attributed some improvements they observed in the puppy to the support from the socialisers:

She (the puppy) could sleep all day if she wanted to, but I think she wouldn't get enough training (and socialisation). Now, the socialisers take her out and they train her. I can actually say that because she gets more and more training, she's picking the new things up a lot quicker so it's not just me. (Edwin)

Wesley appreciated the support from another household member with the morning walk: "One of my housemates gets up at 6:30 every day and walks [the puppy] as part of [their] fitness thing". For raisers who had disapproving housemates and less engaged socialisers, their puppy raising was more challenging. Veronica explained how their experiences improved with engaging puppy socialisers:

My two (socialisers) I've got right now are pretty good, so I'm happy at the moment. They don't seem to be indicating dropping out, so I don't have any issue. But before, I did have an issue. I was left with one socialiser and [that socialiser] wasn't available when I needed, so I had to leave the dog at home occasionally. That's not ideal because [the puppy] is meant to be in training the whole time. (Veronica)

3.1.4. Workplace Support for the Puppy

Being able to integrate puppy socialisation with other commitments presented a convenient opportunity. Veronica explained how bringing their puppy to the university

allowed them to fulfil their study commitments while allowing the puppy to experience various public settings on campus: *"On bad days we'd get one walk in, but I also took her to [the university], so she'd get a walk around [campus]."*

This integration of the puppy into different activities on campus was generally welcomed. As Adrian expressed: *"Everybody knows about her, and they love seeing her at meetings"*. Other raisers similarly reported this. For instance, Harriet's puppy went with them to work daily and could enjoy interactions with students and other staff in their office:

Sometimes she'll sit on that mat and she'll watch where I am, or she'll sit under my feet under the desk. If [my colleague] is here, she'll [the puppy] often sit with her [in the] morning, but keep an eye on where I am. (Harriet)

The campus had received approval from university management to establish dog-friendly facilities (e.g., dog drinking bowl, suitable places for toileting, and the Anthrozoology Research Group Dog Lab where the weekly training took place), and relevant protocols were developed to ensure welfare and safety of both the canine and human members of the university.

3.2. Consistency in Training

In addition to extensive socialisation, it is widely acknowledged that puppies benefit from appropriate training [27,41]. During the puppy raising program, puppies and their raisers received weekly group training, and raisers could access trainers via private social media groups or by telephone outside of training sessions, if needed. There was no restriction on how often raisers could contact trainers or situations to not reach out to the trainers. The extent to which raisers were able to implement what they learned in these sessions was, however, quite variable. Despite their efforts to adhere to recommended training protocols, raisers reported several factors that either facilitated or impeded their capacity to follow the instructions provided.

3.2.1. Puppy Behaviours

Raisers' tolerance of their puppy's behaviours during training appeared to affect raisers' adherence to training protocols. Instructions were put in place to help puppies learn appropriate manners and to discourage inappropriate behaviours. However, the process of achieving these results was unpleasant for some raisers, who tended to relax their training regime to ameliorate the inconvenience of dealing with challenging behaviours. Kate described this process:

When she barks, she squeals, which is part of why it is so stressful, [and] I think is just like a biological thing of responding to babies when they scream. When she was high pitched, I'm like, "It's so high anxiety for me," so I let her out of the crate because I'm like, "I just can't handle it." I think that this probably hindered the crate training a little bit just because she stresses me out so much. I do not put her in there very often. (Kate)

3.2.2. Preparedness for Unanticipated Distractors

Raisers planned training sessions for their puppy, during which they could anticipate potential issues and prepare for these accordingly. However, most training occurred in different settings during the raiser's daily activities, such as when they were at work, shopping, or studying. Adrian described situations where they had to walk the puppy in the presence of distractors that were inevitable in their workplace:

[The trainer] just said to start trying to get her (the puppy) to walk on the left, so I try to assert for her to move on the left, but it's quite difficult because, when she's at university in the corridor, she wants to be on the right because she wants to talk to the people who are coming down in the opposite direction. I would have to shorten the leash down to the point where it was a third the length, and effectively she was having to walk rigidly beside me, which [the trainer] also says isn't ideal. (Adrian)

Some distractors might also be present at home, which was also a hindrance to raisers' ability to provide consistent training. Veronica shared their difficulty when trying to keep the puppy calm at home:

If someone is excited to see her, she will be excited to see them. If someone is not happy [or indifferent] to see her, she generally will not react. Unfortunately, in the case of the person I live with, [my puppy is] very excited to see them almost all the time (because they hype her up against my wishes), so that can be a problem. (Veronica)

These distractions, encountered at home and in the community, meant that even when raisers understood the requirement to carry out training consistently and in line with specific instructions, in some situations they were unable to do this. It was difficult for raisers to be fully prepared for all situations, and it was particularly difficult when they were engaged in other matters and the puppy was not their primary focus.

3.2.3. Accessibility to Timely Advice

It appeared in this study that strict adherence to the organisations' instructions depended on raisers' having ready access to protocols that applied to specific situations. Although some protocols were made available, it was not practical that they could cover all possible situations. Therefore, raisers found it helpful when they were able to reach out to the organisation for advice regarding situations when they felt uncertain. For instance, Fiona stated: "[I] double-check everything twice with [the organisation] to make sure because I do not want to do anything that was going to jeopardize her."

However, it was not always practical for the raisers to obtain timely advice from the organisation for incidents that required immediate responses. While the organisation typically had specific instructions for how to interact with the puppy, Jane described other improvised strategies she used in uncertain situations:

It has been working pretty well if you distract her with a toy (as recommended) and then sometimes if she gets a little bit hyperactive, then the toy does not necessarily always work. I might take her for a walk then or something to try and burn some of her energy. (Jane)

The raisers' self-reported reactions to those situations were mostly based on their best judgement and experience and were often appropriate. However, it is not ideal for program adherence if raisers regularly have to rely on their own judgement. Having access to advice is critical, as is training raisers sufficiently so that they can troubleshoot effectively. Puppy raiser training is discussed later in this paper.

In short, for raisers to consistently carry out the training instructions provided, it was necessary that they were aware of the relevant protocols or able to seek immediate advice from their program provider for different situations, such as managing puppies' temperament or their safety in public places. However, there were many situations where it was not practical for raisers to obtain timely advice from the organisation or where it was inconvenient for them to apply a particular training method.

3.2.4. Perceived Judgement of Training Techniques

Puppy training can be a controversial process which requires a careful balance between positive reinforcement of desired behaviours, coupled with effective and humane techniques for preventing or discouraging undesirable behaviours. Perceived negative judgements of training techniques made by others hindered some raisers' confidence to perform these techniques in public places. It is important to note that members of the public do sometimes comment on specific puppy-raising situations in ways that are judgemental, even when the techniques being applied are benign. For example, one of the authors of this paper has been reprimanded for using a hand to gently guide a puppy into a sitting position while waiting at a street corner to cross a busy road, and has also been instructed by well-meaning members of the public not to use food rewards while training a puppy to sit quietly in a shopping centre as they may "spoil" the puppy. The point here is not to

debate the value of different training practices, but to highlight that perceptions of public judgement can interfere with the raising process. Veronica shared their sentiment regarding how other people's opinions about their training techniques might have had an impact on their confidence to perform the tasks in public places:

If people do not train the dogs, they do not understand what's going on (when we use certain techniques especially regarding lead training and barking distraction training, use a halt or have certain rules like not running off lead or not getting pats). They think it is [not acceptable], so we [. . .] do (some techniques) indoors, away from people. Which we have been doing a bit, and she is getting the point. She is getting there (getting better with her training/behaviour). It is mostly with her meeting people and other dogs really. [. . .] If someone [comes] up to me and [says], that's [not acceptable], then hopefully, I [am] with [another puppy raiser] or any of the dog people who might help me speak up (justify training choices and why they are not harmful). (Veronica)

In planned training and socialisation sessions, raisers could join each other and provide support for technical and emotional issues. However, with daily encounters for which the raisers did not specifically plan, upholding consistent training for their puppy appeared to be challenging.

3.3. Effective Learning

During the puppy raising program, raisers were required to learn appropriate strategies and skills to guide their puppy's learning and to help them navigate multiple developmental stages. Promoting raisers' engagement in effective learning required efforts from the program provider, both formally through the provision of instructions, and informally through the endorsement of peer-support. It also required commitment from the raisers, who needed to engage in help-seeking behaviours and active learning strategies. Several factors influenced how successful this process was.

3.3.1. Raiser's Learning Style

Raisers had different preferences regarding what and how they would like to learn from the organisation. In the beginning, raisers preferred to be provided with more information and knowledge, either via written instructional materials or in-person inquiries with the organisation's staff. Then, further into the program, raisers' preferences shifted to in-person instructions that they received during the weekly training sessions. Edwin described this change in their preferred mode of instruction: *"I've probably been following more of what [the trainer] says, but less on the paperwork."*

A benefit of in-person instructions that Edwin mentioned included the opportunity to observe step-by-step demonstrations by trainers. Other favoured features of the training sessions included the scaffolded design of teaching skills, and trainers' knowledge and expertise. Wesley commented on the weekly sessions:

I think the instructions are straightforward and what [the trainer] demonstrates are immediate effective results that he can demonstrate. That's a powerful learning tool from a learner's perspective. He clearly understands the language of the dog, and they understand that from him. He delivers training progressively. Each week there is a new skill, but reiteration of the previous week's skill, which is an effective learning strategy. (Wesley)

The provision of simple instructions helped some raisers address their puppy's immediate issues, although other raisers expressed an interest in receiving more in-depth understanding of the training techniques. Kate recalled a question they had for the trainer early in the program:

I think that [detailed explanations] were missing a little bit early on. I used to say all the time that if [the trainer] can look at the dog, see the problem, [he can] tell you what the solution is, but he doesn't show his work. [. . .] You just sort of do what you're told

because you were told to do it, which absolutely makes sense because they're dealing with a lot of people who don't necessarily know about the dogs, but it can really help. (Kate)

Overall, although written instructions were helpful mostly during the early stages of the program, where they provided information to meet the raisers' frequently asked questions, raisers tended to differ in their preferred modes of learning and the level of detail they preferred as they and their puppies progressed in the program.

3.3.2. Opportunity for Peer-Learning

Raisers often reported benefits of learning from and sharing experiences with other raisers between the weekly formal training sessions. Fiona distinguished the informal advice from other raisers from the formal weekly instructions provided by the organisation:

The organisation is more instructional and then they can answer questions and stuff like that, but it's only once a week. If things come up in the week, that's when I feel like the other puppy raisers and socializers are helpful [. . .]. If there's something that I have trouble with, if I run into someone or if I have a question, I can either post it on Facebook (in a private group that was exclusively accessed by the raisers and socialisers in the current study) or send someone a message. (Fiona)

Raisers needed to practise the skills they learned in the weekly instruction sessions. Therefore, assisting one another in this process benefited the raisers' learning and training for their puppies. Kate described some in-field training activities they had with the other raisers: *"A couple of weeks ago I was able to go do some recall training with Wesley and [Wesley's puppy] because [they] needed some work on that. We went out and did some work together."* In addition, when raisers encountered puppy behavioural issues, they often checked in with the other raisers before deciding whether to escalate the issues to the trainer. The availability of other raisers not only facilitated their learning by allowing for informal inquiries but also provided more opportunities to practice the skills they had learned during the training sessions.

3.3.3. Help-Seeking Attitude

Not seeking help was a barrier to effective learning and skills acquisition. In the current study, raisers reported two reasons for not contacting the organisation despite knowing that it would have been helpful if they had done so. First, they might have already asked many questions before and so they were afraid of bothering the training staff. This hesitation was still relevant even when the organisation explicitly encouraged them to reach out if they had any concerns. Fiona maintained:

I do think [the trainer] did emphasize that if there is a problem, it's best to say there is a problem, as opposed to just trying to suffer it out, because sometimes the fix is just so quick and easy. I remember them saying that before, but for some reason, I still felt a little bit trepidatious about bothering them too much. (Fiona)

Raisers suggested that it would help to include in the *"instruction book they gave us [about the] do's and don'ts in different situations so that we don't have to always ask [and wait for a response]"* (Veronica).

The second reason affecting raisers' willingness to reach out for help related to how they perceived staff's availability and responsiveness. Early in the program, Adrian shared that *"[the training staff] want us to contact them 24/7, but they take a long time to get back to you."* Therefore, their suggestion was to have more staff available to help answer raisers' questions.

Despite the staff's busy schedules, after the organisation was informed about this issue, there was an improvement in the organisation's responsiveness to the raisers' inquiries. Wesley reviewed the staff's responsiveness and said that *"I feel as if they respond within a good amount of time. It's in the day. I know he's busy."* Jane echoed this sentiment and described this improvement in more detail:

If I send them a question in the WhatsApp group, they'll get back to me pretty quickly. They're really informative and really passionate as well, which helps. It shows how motivated they are and helps you be motivated and things like that. (Jane)

Encouraging help-seeking did not seem to be sufficient. For frequently encountered issues, raisers suggested that having an easily accessed online and/or printed knowledge base would allow them to explore the answer to their inquiries instantly. It also appeared that organisations should be available to help answer their raisers' concerns, especially when they first start to raise an assistance dog puppy.

In summary, the current findings identified several factors that facilitated or hindered (or both, depending on the raisers' circumstances) the puppy raisers' engagement in frequent socialisation, consistent puppy training, and their ongoing effective learning. Those factors and their influences on the raisers' practices are illustrated in Figure 1.

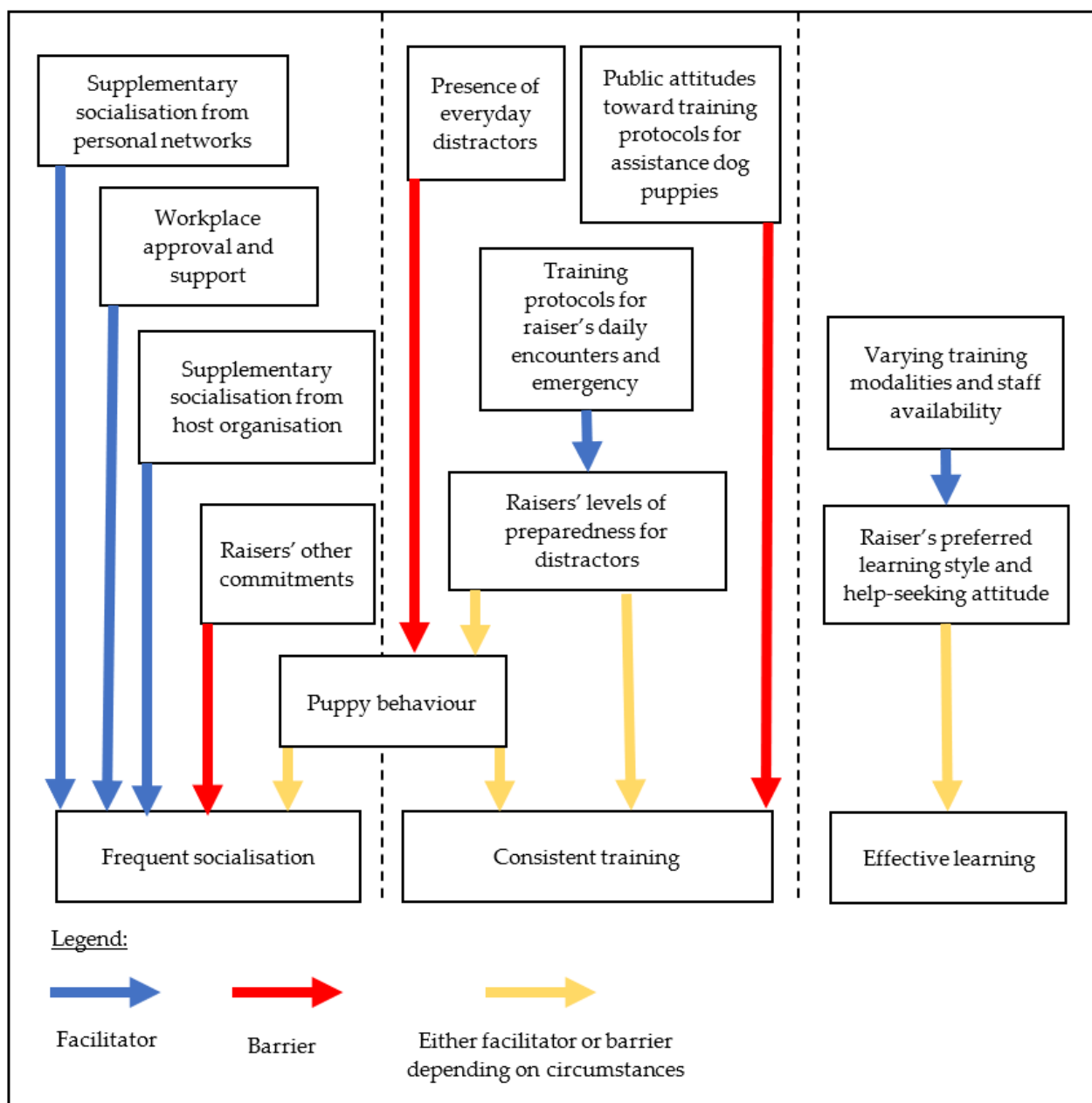


Figure 1. Multiple levels of facilitators and barriers to raiser's engagement in recommended practices.

4. Discussion

The current study aimed to explore factors that facilitate or hinder volunteer puppy raisers' engagement in recommended practices. The three recommended practices arising from the working dog literature [22,27–29] that pertain to assistance dog raisers include frequent socialisation and consistent training for the puppy, and engagement in effective ongoing learning for the raiser. The findings revealed four common themes that appeared to influence raisers' provision of frequent socialisation opportunities for their puppy (see Figure 1). These included raisers' other commitments, workplace acceptance and support, availability of additional supports, and the puppy's behaviours. Factors influencing training consistency included raisers' preparedness for everyday distractors, accessibility to timely advice, perceived public judgement of training techniques, and the puppy's behaviour. For engagement in effective learning, factors such as suitability of instruction methods to the raisers' learning preferences, availability of opportunities for peer learning, and their help-seeking attitude influenced success.

The current literature often refers to socialisation with a focus on the puppy, such as recommendations for how to manage their exposure [22]. In the current study, we explored socialisation from the perspective of the raisers and considered two behavioural aspects of raisers' practice: creating socialisation opportunities for their puppy (i.e., frequency of socialisation) and consistently following instructions. The current study is the first, to our knowledge, to look at socialisation frequency as a specific aspect of raisers' practice, though the factors identified in the current study reflect past findings in the assistance dog literature [3–5]. Raisers in Chur-Hansen et al.'s [4] study reported feeling overwhelmed by the workload associated with raising their puppy. With a more specific focus on the raisers' practices, the current study found that a conflict between different priorities affected their puppy's socialisation opportunities.

Mai et al. [3] added to Chur-Hansen et al.'s [4] findings regarding the adverse effects of some puppies' undesirable behaviours on the raisers' experience. Mai et al. [3] found that raisers enjoyed raising an easy-going puppy, which made their raising experience easier and more positive. The current findings extended on this, in that some puppies' disruptive behaviours made it less convenient and discouraged raisers from taking their puppy with them to many public places, which created a vicious circle that reduced the puppy's opportunities to learn and improve their behaviours. It may seem straightforward to ask raisers to offer puppies ample public exposure opportunities; however, many everyday life factors, such as raisers' availability and their puppy's behaviour, could hinder a raiser's initiation of those practices.

As Mai et al. [3] suggested, organisational support, which was reported as lacking from the program studied by Chur-Hansen et al. [4], could help raisers in many ways. In the current study, support from the program provider appeared to help raisers create socialisation opportunities for their puppy. Knowing that raisers in the current study were either full-time staff or students, the program provider involved their family members and housemates in the training sessions, and also recruited and provided training for other staff and students (socialisers) to assist the raisers. These supplementary supports were generally reported as helpful, allowing the raisers some breaks during the week or during their work and/or study. It also helped the raisers when the University offered support through acknowledging the program in their public advertisements and internal communications, and via provision of dog-friendly environments and safety features (e.g., the Anthrozoology Research Group Dog Lab, the automatic water bowl).

For young puppies, training is largely inseparable from socialisation during outings [3,4]. Therefore, it is likely that these extra supporters also provided the puppies with some degree of training. The effectiveness of this additional training was not evaluated in the current study, but the supplementary socialisation provided in this program clearly increased the total number of hours spent socialising each puppy. Understanding its effectiveness requires further information about the competency and consistency of the supporters, which was not available. We also acknowledge that accessing extra personnel

to perform the role of “socialiser” may not be possible in all contexts. Participating in a campus-based puppy raising program enables a large number of people to cooperate in the training process in a concentrated geographical area.

Masinter [42] noticed a growing trend in raising assistance dogs amongst university or college students in the United States. While organisations and educational institutions must accommodate accredited service or assistance dogs, Masinter [42] argues that whether to offer access rights to assistance dog puppies, who are handled by puppy raisers, on their premises remains at their discretion as the puppies are not in formal training or supervised by certified dog trainers. Such decisions about public access rights of assistance dog puppies (who are being house-broken and socialised by puppy raisers) versus fully certified assistance dogs or assistance dog candidates being trained by qualified trainers need to be made in consultation with local authorities. We contend that colleges and universities offer environments that can be particularly well suited for assistance-dog puppy raising, particularly when it is possible to augment these programs with the additional support identified in the current study. This allowed raisers to leave their puppy with trained socialisers when they were at work or study, and also included provision of additional facilities for group training events. Although there have been previous reports of puppies being raised by university staff and students [43] and inmates [44], the focus was mostly on the effects of participation on the raisers. Future research should also evaluate the effectiveness of different puppy raising models in terms of cost and feasibility of program operation, and the outcomes for both the raisers and their puppy.

Regarding raisers’ training consistency, the current findings extend beyond the existing literature, which mostly concerns the welfare and effectiveness of various training methods and techniques [25,45,46]. One common feature in the dog training literature is the importance of consistency in training on behavioural learning in animals generally [45], and dogs specifically [47]. In puppy raising programs, raisers should closely and consistently follow instructions from their program provider.

Strict and consistent adherence to program protocols may not be practical in some situations. The themes emerging from the current findings suggest several barriers to this process, which range from the raisers’ everyday encounters, through to perceived judgements from the public regarding particular training techniques, to the puppy’s own behaviour. The current findings reveal a more practical perspective in which spontaneous distractors and the occurrence of complex situations reported by raisers present real-life barriers that research and industry should consider in their recommendations and during development of training protocols. Implementing recommendations for best practices in training and socialisation may be possible in some circumstances. However, because daily life can be unstructured and unpredictable, collective efforts from the industry are required to further understand the myriad difficulties and challenges that arise in raisers’ lives, and how these might affect program adherence and subsequent dog behaviour outcomes.

High demand for assistance dogs is a justification for recruiting inexperienced puppy raisers and allowing them to gain knowledge and skills as they raise their first puppy. Ideally, raisers will incorporate their experiences and knowledge from raising their first puppy into raising subsequent ones. However, it is not realistic to assume this is always the case, as struggling and demotivated raisers may not go on to raise another puppy [4,5]. It is not ethical to involve volunteers in a challenging role without considering their suitability and providing adequate support and training during their participation. Assistance Dog International [48] requires its member organisations to provide support and a training program to their volunteer raisers. Regardless of support, it is still necessary that the novice raisers meet some basic requirements. In acknowledging the challenges of raising puppies, some guide dog organisations require interested volunteer raisers to be assessed as physically and psychologically fit to the role [49]. The current findings resonate with those requirements, particularly when the raisers had to handle a large dog with a high level of energy and/or disruptive behaviours. In determining the nature of organisational support and approach to volunteer recruitment, the assistance dog industry could benefit

from findings and frameworks in industrial–organisational (IO) psychology [50]. IO psychology focuses on how personnel recruitment, task design, and training would improve employees and volunteers' job satisfaction and performance in not-for-profit sectors [50–53]. Mai et al. [11] have argued for a central role of puppy raisers in achieving better outcomes of the puppy raising process, which supports a potential application of IO psychology frameworks in assistance dog puppy raising research.

Relevant also to first-time puppy raisers is the learning component of their puppy raising practice. As it can be demanding for raisers to learn new skills as they raise their puppy, it helps when they adopt effective learning strategies. Past research found that outcomes of puppy raising for first-time raisers were less favourable than for their experienced counterparts [54,55]. Mai et al. [3] suggested that, although more experience could enable raisers to increase their competency, organisations could accelerate this process by providing raisers with not only training and education but also with opportunities for supervised practice of relevant skills.

The current findings add to this suggestion by confirming that such opportunities could be provided through peer learning activities. Raisers are not professional dog trainers, which means that their advice for each other was informal and might not necessarily be as effective for certain issues as advice from the trainers. However, the raisers in our study reported several benefits of seeking help from other puppy raisers, and some preferred this over more formal advice. Peer-learning is not a new concept and benefits are manifold—it is cost-effective for the organisation, more accessible for the learners, and enables both learners and helpers to consolidate and strengthen their knowledge and skills [56,57]. If appropriately designed and managed, an official peer learning program also appears to address the other two barriers identified in the current study, i.e., instruction methods that do not suit raisers' preferences, and raisers' hesitation to engage in help-seeking. These barriers to raisers' learning were also identified in Mai et al. [3] as factors affecting raisers' experiences generally. While it may be logistically challenging to vary instruction methods to meet each raiser's individual preferences, an organisation may provide advice and protocols for peer-learning activities that can then take different forms. They can also arrange socialisation and training sessions where raisers can interact and, as Mai et al. [3] suggested, set up an online discussion forum with experienced raisers or staff to act as mediators, ensuring the accuracy of any advice offered by peers and directing questions to trainers when necessary.

Limitations

Different organisations have different program designs, and their volunteer raisers may have different work arrangements and life experiences than the raisers in the current study. The current raisers studied or worked at the same university campus and participated in the same puppy raising program. Therefore, the current findings may have limited applicability elsewhere. We also focused on exploring the raisers' practices and did not collect data on which puppies were successful in advancing to the next stage of training. Furthermore, the opportunity to provide de-identified feedback through, and frequent contact with, the authors in this study could be extraneous factors that contributed to the raisers' positive experiences and practices. Although the participatory action feature of this study is appropriate in applied social research [58] to protect the raisers from known challenges associated with raising an assistance dog puppy [4], more definitive and objective investigations of facilitating and hindering factors on raisers' practices are required to address the limitations of this study.

5. Conclusions

Research on raising and training assistance dogs has focused extensively on puppy selection, with little attention being paid to another important factor: management of the puppy's behavioural development by volunteer puppy raisers [11]. The current research aimed to identify factors that facilitate or hinder puppy raisers' performance of effective

practices, which has been a significant gap in the past literature. Three recommended practices emerged from reviewing the working dog literature, a broader category which covers assistance dogs. These were: providing frequent socialisation opportunities, adhering to consistent training protocols, and adopting effective learning strategies [22,27–29].

The findings of the current study revealed that factors hindering raisers' provision of frequent socialisation for their puppy included having other commitments and the puppy's disruptive behaviours. On the other hand, two factors facilitated this practice: receiving additional supports from other family members, friends, or socialisers assigned by the program provider, and approval and support from their workplace. Although raisers generally attempted to follow the program's protocols, they reported several barriers. These included the presence of unpredictable and unavoidable distractors in their everyday situations, access to timely advice, perceived negative judgement from the public about their training techniques, and their tolerance of the puppy's behavioural issues. To facilitate raisers' effective learning, raisers suggested that comprehensive instructions and information should be provided in advance and made available in various modes to suit their preferences. Raisers also reported that having opportunities to learn from and practice with other raisers was helpful. In contrast, they were hesitant to approach trainers frequently for commonly encountered matters, most often out of concern for repeatedly bothering the trainers, despite these interactions being welcomed by the trainers. In understanding these emergent factors, the assistance dog industry could extend the use of their existing recommendations and puppy raising tasks, which are generally effective when they are performed in controlled settings and/or by experienced trainers and raisers, to be implemented reliably across all puppy raisers, particularly the less experienced ones. It is recommended that organisations recruit raisers who can meet the physical and behavioural demands of their puppy and pay sufficient attention to quality assurance of their organisational communication, peer-learning and mentoring programs.

Supplementary Materials: The following are available online at <https://www.mdpi.com/article/10.3390/ani11051195/s1>, Table S1: Semi-structured interview schedules for puppy raisers.

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References

1. Assistance Dogs International. About Us. Available online: <https://assistedogsinternational.org/about-us/> (accessed on 21 March 2019).
2. National Disability Insurance Scheme. Including Specific Types of Supports in Plans Operational Guideline—Assistance Animals. Available online: <https://www.ndis.gov.au/about-us/operational-guidelines/including-specific-types-supports-plans-operational-guideline/including-specific-types-supports-plans-operational-guideline-assistance-animals> (accessed on 4 February 2021).
3. Mai, D.; Howell, T.; Benton, P.; Bennett, P.C. Raising an assistance dog puppy—Stakeholder perspectives on what helps and what hinders. *Animals* **2020**, *10*, 128. [CrossRef] [PubMed]
4. Chur-Hansen, A.; Werner, L.K.; McGuinness, C.E.; Hazel, S. The experience of being a guide dog puppy raiser volunteer: A longitudinal qualitative collective case study. *Animals* **2014**, *5*, 1–12. [CrossRef]

5. DeWitt, A.L. Returning a puppy for dog guide training: Factors that affect grief in puppy raisers and the decision to foster again. *J. Vis. Impair. Blind.* **2020**, *114*, 289–300. [\[CrossRef\]](#)
6. Lockyer, J.M.; Oliva, J.M. Better to have loved and lost? Human avoidant attachment style towards dogs predicts group membership as ‘forever owner’ or ‘foster carer’. *Animals* **2020**, *10*, 1679. [\[CrossRef\]](#) [\[PubMed\]](#)
7. Arata, S.; Momozawa, Y.; Takeuchi, Y.; Mori, Y. Important behavioral traits for predicting guide dog qualification. *J. Vet. Med. Sci.* **2010**, *72*, 539–545. [\[CrossRef\]](#) [\[PubMed\]](#)
8. Tomkins, L.M.; Thomson, P.C.; McGreevy, P.D. Behavioral and physiological predictors of guide dog success. *J. Vet. Behav.* **2011**, *6*, 178–187. [\[CrossRef\]](#)
9. Wirth, K.E.; Rein, D.B. The economic costs and benefits of dog guides for the blind. *Ophthalmic Epidemiol.* **2008**, *15*, 92–98. [\[CrossRef\]](#)
10. Plomin, R.; Asbury, K. Nature and nurture: Genetic and environmental influences on behavior. *Ann. Am. Acad. Pol. Soc. Sci.* **2005**, *600*, 86–98. [\[CrossRef\]](#)
11. Mai, D.; Howell, T.; Benton, P.; Bennett, P.C. Beyond puppy selection—Considering the role of puppy raisers in bringing out the best in assistance dog puppies. *J. Vet. Behav.* **2021**, *42*, 1–10. [\[CrossRef\]](#)
12. Freedman, D.G.; King, J.A.; Elliot, O. Critical period in the social development of dogs. *Science* **1961**, *133*, 1016–1017. [\[CrossRef\]](#)
13. Appleby, D.L.; Bradshaw, J.W.; Casey, R.A. Relationship between aggressive and avoidance behaviour by dogs and their experience in the first six months of life. *Vet. Rec.* **2002**, *150*, 434–438. [\[CrossRef\]](#)
14. Vaterlaws-Whiteside, H.; Hartmann, A. Improving puppy behavior using a new standardized socialization program. *Appl. Anim. Behav. Sci.* **2017**, *197*, 55–61. [\[CrossRef\]](#)
15. Overall, K.L. *Manual of Clinical Behavioral Medicine for Dogs and Cats*; Elsevier Health Sciences: St. Louis, MO, USA, 2013.
16. Yakovlev, P.; Lecours, A.R. The myelogenetic cycles of regional maturation of the brain. In *Resional Development of the Brain in Early Life: Symposium*; Minkowski, A., Ed.; Blackwell Science: Oxford, UK, 1967; pp. 3–70.
17. Sowell, E.R.; Thompson, P.M.; Holmes, C.J.; Jernigan, T.L.; Toga, A.W. In vivo evidence for post-adolescent brain maturation in frontal and striatal regions. *Nat. Neurosci.* **1999**, *2*, 859–861. [\[CrossRef\]](#)
18. Fox, M.W. *Integrative Development of Brain and Behavior in the Dog*; University of Chicago Press: Chicago, IL, USA, 1971.
19. Luna, B.; Garver, K.E.; Urban, T.A.; Lazar, N.A.; Sweeney, J.A. Maturation of cognitive processes from late childhood to adulthood. *Child Dev.* **2004**, *75*, 1357–1372. [\[CrossRef\]](#) [\[PubMed\]](#)
20. Bateson, P. How do sensitive periods arise and what are they for? *Anim. Behav.* **1979**, *27*, 470–486. [\[CrossRef\]](#)
21. Boxall, J.; Heath, S.; Bate, S.; Brautigam, J. Modern concepts of socialisation for dogs: Implications for their behaviour, welfare and use in scientific procedures. *Altern. Lab. Anim.* **2004**, *32*, 81–93. [\[CrossRef\]](#)
22. Rooney, N.J.; Clark, C.C.A.; Casey, R.A. Minimizing fear and anxiety in working dogs: A review. *J. Vet. Behav.* **2016**, *16*, 53–64. [\[CrossRef\]](#)
23. Hiby, E.; Rooney, N.J.; Bradshaw, J.W.S. Dog training methods: Their use, effectiveness and interaction with behaviour and welfare. *Anim. Welf.* **2004**, *13*, 63–69.
24. Blackwell, E.J.; Twells, C.; Seawright, A.; Casey, R.A. The relationship between training methods and the occurrence of behavior problems, as reported by owners, in a population of domestic dogs. *J. Vet. Behav.* **2008**, *3*, 207–217. [\[CrossRef\]](#)
25. Todd, Z. Barriers to the adoption of humane dog training methods. *J. Vet. Behav.* **2018**, *25*, 28–34. [\[CrossRef\]](#)
26. Mai, D.; Howell, T.; Benton, P.; Bennett, P.C. Socialisation, training, and help-seeking—Specific puppy raising practices that predict desirable behaviours in trainee assistance dog puppies. *Appl. Anim. Behav. Sci.* **2021**, *236*, 105259. [\[CrossRef\]](#)
27. Cobb, M.; Branson, N.; McGreevy, P.; Lill, A.; Bennett, P. The advent of canine performance science: Offering a sustainable future for working dogs. *Behav. Process.* **2015**, *110*, 96–104. [\[CrossRef\]](#) [\[PubMed\]](#)
28. Bremhorst, A.; Mongillo, P.; Howell, T.; Marinelli, L. Spotlight on assistance dogs—Legislation, welfare and research. *Animals* **2018**, *8*, 129. [\[CrossRef\]](#)
29. Working Dog Alliance Australia. *Review & Assessment of Best Practice Rearing, Socialization, Education and Training Methods for Greyhounds in a Racing Context*; Working Dog Alliance Australia: Sydney, Australia, 2015.
30. Howell, T.J.; Bennett, P.C. Puppy power! Using social cognition research tasks to improve socialization practices for domestic dogs (*Canis familiaris*). *J. Vet. Behav.* **2011**, *6*, 195–204. [\[CrossRef\]](#)
31. Fratkin, J.L. Examining the Relationship between Puppy Raisers and Guide Dogs in Training. Ph.D. Thesis, The University of Texas at Austin, Austin, TX, USA, August 2015.
32. Australian Bureau of Statistics. 2016 Census QuickStats. Available online: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/202 (accessed on 24 October 2020).
33. Thomson, R.; Plumridge, L.; Holland, J. Editorial: Longitudinal qualitative research—A developing methodology. *Int. J. Soc. Res. Methodol.* **2003**, *6*, 185–187. [\[CrossRef\]](#)
34. Welsh, E. Dealing with data: Using NVivo in the qualitative data analysis process. *Forum Qual. Soc. Res.* **2002**, *3*. [\[CrossRef\]](#)
35. Elo, S.; Kyngas, H. The qualitative content analysis process. *J. Adv. Nurs.* **2008**, *62*, 107–115. [\[CrossRef\]](#)
36. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [\[CrossRef\]](#)
37. Weiss, C.H. Nothing as practical as good theory: Exploring theory-based evaluation for comprehensive community initiatives for children and families. In *New Approaches to Evaluating Community Initiatives: Concepts, Methods, and Contexts*; Connell, J., Kubisch, A., Schorr, L., Weiss, C., Eds.; Aspen Inst Human Studies: Washington, DC, USA, 1995; Volume 1, pp. 65–92.

38. Michie, S.; Johnston, M.; Abraham, C.; Lawton, R.; Parker, D.; Walker, A. Making psychological theory useful for implementing evidence based practice: A consensus approach. *Qual. Saf. Health Care* **2005**, *14*, 26–33. [CrossRef]
39. Cane, J.; O'Connor, D.; Michie, S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implement. Sci.* **2012**, *7*, 37. [CrossRef]
40. Atkins, L.; Francis, J.; Islam, R.; O'Connor, D.; Patey, A.; Ivers, N.; Foy, R.; Duncan, E.M.; Colquhoun, H.; Grimshaw, J.M.; et al. A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implement. Sci.* **2017**, *12*, 77. [CrossRef] [PubMed]
41. Haverbeke, A.; Laporte, B.; Depiereux, E.; Giffroy, J.; Diederich, C. Training methods of military dog handlers and their effects on the team's performances. *Appl. Anim. Behav. Sci.* **2008**, *113*, 110–122. [CrossRef]
42. Masinter, M.R. What rights do puppy raisers have on campus? *Disabil. Compliance High. Educ.* **2018**, *23*, 1–3. [CrossRef]
43. Lahman, M.P. By my side: The university's first service dogs. *Health Commun.* **2018**, *33*, 222–224. [CrossRef] [PubMed]
44. Cooke, B.J.; Farrington, D.P. The effectiveness of dog-training programs in prison: A systematic review and meta-analysis of the literature. *Prison J.* **2016**, *96*, 854–876. [CrossRef]
45. McGreevy, P.D.; McLean, A.N. Roles of learning theory and ethology in equitation. *J. Vet. Behav.* **2007**, *2*, 108–118. [CrossRef]
46. Coppinger, R.; Coppinger, L.; Skillings, E. Observations on assistance dog training and use. *J. Appl. Anim. Welf. Sci.* **1998**, *1*, 133–144. [CrossRef] [PubMed]
47. Arhant, C.; Bubna-Littitz, H.; Bartels, A.; Futschik, A.; Troxler, J. Behaviour of smaller and larger dogs: Effects of training methods, inconsistency of owner behaviour and level of engagement in activities with the dog. *Appl. Anim. Behav. Sci.* **2010**, *123*, 131–142. [CrossRef]
48. Assistance Dogs International. Summary of ADI Standards. Available online: https://assistedogsinternational.org/clientuploads/Summary%20of%20Standards/Summary_ADI_Standards_2020_revision.pdf (accessed on 31 January 2021).
49. Guide Dogs. Health Requirements for Puppy Raising. Available online: <https://vic.guidedogs.com.au/get-involved/volunteering/become-puppy-raiser/health-demands-required-puppy-raisers/> (accessed on 4 February 2021).
50. Anderson, N.; Ones, D.S.; Sinangil, H.K.; Viswesvaran, C. *Handbook of Industrial, Work & Organizational Psychology: Personnel Psychology*; SAGE Publications: London, UK, 2001; Volume 1.
51. Olson-Buchanan, J.B.; Koppes Bryan, L.L.; Thompson, L.F. *Using Industrial-Organizational Psychology for the Greater Good: Helping Those Who Help Others*; Taylor & Francis Group: London, UK, 2013.
52. Silvester, J. Work and organizational psychology. In *The SAGE Handbook of Qualitative Research in Psychology*, 2nd ed.; Willig, C., Stainton-Rogers, W., Eds.; SAGE Publications Ltd.: London, UK, 2008; pp. 489–504.
53. Millette, V.; Gagné, M. Designing volunteers' tasks to maximize motivation, satisfaction and performance: The impact of job characteristics on volunteer engagement. *Motiv. Emot.* **2008**, *32*, 11–22. [CrossRef]
54. Serpell, J.A.; Duffy, D.L. Aspects of juvenile and adolescent environment predict aggression and fear in 12-month-old guide dogs. *Front. Vet. Sci.* **2016**, *3*, 49. [CrossRef]
55. Svartberg, K. Shyness-boldness predicts performance in working dogs. *Appl. Anim. Behav. Sci.* **2002**, *79*, 157–174. [CrossRef]
56. Boud, D.; Cohen, R.; Sampson, J. *Peer Learning in Higher Education: Learning from and with Each Other*; Routledge: London, UK, 2001.
57. Topping, K.J. Trends in peer learning. *Educ. Psychol.* **2005**, *25*, 631–645. [CrossRef]
58. Reason, P.; Bradbury, H. *Handbook of Action Research: Participative Inquiry and Practice*; Sage: London, UK, 2001.

Supplementary Material

Facilitators and Barriers to Assistance Dog Puppy Raisers' Engagement in Recommended Raising Practices

Dac Mai ^{1,*}, Tiffani Howell ¹, Pree Benton ², Virginia Lewis ³, Lynette Evans ⁴ and Pauleen C. Bennett ¹

¹ Anthrozoology Research Group, Department of Psychology and Counselling, School of Psychology and Public Health, La Trobe University, Flora Hill, VIC 3552, Australia; T.Howell@latrobe.edu.au (T.H.); Pauleen.Bennett@latrobe.edu.au (P.C.B.)

² Centre for Service and Therapy Dogs Australia, Melbourne, VIC 3162, Australia; Pree.Benton@dogsforlife.com.au

³ Australian Institute for Primary Care and Ageing, La Trobe University, Bundoora, VIC 3086, Australia; V.Lewis@latrobe.edu.au

⁴ School of Psychological Science, La Trobe University, Bundoora 3086, Victoria, Australia; L.Evans@latrobe.edu.au

* Correspondence: Jimmy.Mai@latrobe.edu.au; Tel.: +61-035-444-7317

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Table S1. Semi-structured interview schedules for puppy raisers.

Opening Question	
Tell me about your experience with the puppy raising during the last month.	
Prompts	
At home	Joy, difficulties associated with having the puppy at home; changes to daily routines/activities.
At work	In your office, in the classroom; attitudes towards others' reactions towards the puppy's present; changes to workplace dynamic and/or personal productivity.
Organisation	Attitudes towards levels of support received; feedback on program design.
Personal development	What have you learned about raising an assistance dog puppy?
	Whether you learned that from our personnel or outside/online sources
Note: We will be focusing on the participants' experience. Not reporting on the puppy progress, but how the progress relates to their experience during the week. Duration: expected to be approximately 15 min.	

Further Discussion

This chapter focused on raisers' program experiences and aimed to understand factors affecting the raisers' practices. The phenomenological approach of this study was adopted to explore aspects of raisers' program experiences. At the same time, theory-driven data analysis narrowed the themes to existing recommendations in the working dog literature, which ensured the emerging factors were specific to raiser practices—the practical aspect directly related to puppy behaviour. The three practices recommended for puppy raisers, which emerged from the working dog literature, included frequent socialisation, consistent training for puppies, and raisers' ongoing effective learning. Although the conceptualisations of theory-driven raisers' practices in this chapter slightly varied from those of the three data-driven raisers' practices in Chapter 4, the facilitators and barriers identified in this chapter were highly consistent with the findings in Chapters 3 and 4.

The raiser practice items in Chapter 4 reflected many PR aspects, such as raisers' competency (e.g., *'I know what to do when my puppy doesn't behave'*), perseverance and passion (e.g., *'I walk my puppy regularly, even when I don't feel like it'*). Some items described different activities relating to puppies' socialisation (e.g., *'I take my puppy to many different public places, e.g., shopping centres, cafes, events'*) and training (e.g., *'I am always consistent with commands when training my puppy'*). Help-seeking behaviour in Chapters 3 and 4 was considered as a separate influencing factor.

In this chapter, puppy socialisation and training, the two raiser practice themes derived from the working dog literature, were conceptualised more objectively using behavioural descriptions (i.e., frequency of socialisation and consistency of following training instructions). Raisers' responses were then thematically analysed based on their relevance to these predetermined raiser practices. Furthermore, in the current chapter, raisers'

competency has now been classified as a learning outcome and help-seeking behaviour has been classified as an influencing factor in the raisers' ongoing effective learning.

Despite adopting different conceptualisations of raisers' practices, the facilitators and barriers identified in this chapter echoed earlier findings in this thesis. Specifically, the findings in this chapter were in line with Chapters 3 and 4 when suggesting: the influences of raisers' help-seeking behaviour on the quality of their practices; the benefits from supplementary supports from socialisers and family; raisers' competency or preparedness for unanticipated distractors; and, a preference for peer-learning. The current findings also agreed with Chapter 3 in terms of the benefits of having instructions in multiple modalities, the influences of puppies' behaviour, workplace supports for the puppies, and perceived judgement of training techniques. Although the studies in this thesis were of different methodologies and study designs and different conceptualisations of raisers' practices, their findings were highly consistent.

The mention of support from family members, friends, and work colleagues in Chapters 3 and 4 was explained further in this chapter. In particular, some benefits were attributable to having family and household members who received the same training, and shared the PR responsibilities (i.e., training and socialising the puppies), with the primary raisers. The benefits also came from support from their workplace and trained volunteer puppy socialisers, who may be regarded as analogous to the puppy sitters mentioned in Chapter 4. Raisers were negatively affected by disapproving household members (e.g., Veronica) or distraction from members of the public (e.g., Adrian). These factors, present in the raisers' natural living and working environment, have not been characterised in past research nor in the previous chapters of this thesis.

Chapter Summary

This chapter aimed to explore factors affecting raisers' PR practices. Three recommendations emerged from reviewing the working dog literature concerning raisers' practices: frequent puppy socialisation, consistent training, and raisers' ongoing learning. The longitudinal qualitative study in this chapter characterised several facilitating and hindering factors to the raisers' participation in activities consistent with the three recommended practices. Although the theory-driven conceptualisations of the raisers' practices in this chapter differ from the data-driven constructs of the raisers' practices in the exploratory stream (Chapters 3 and 4), their findings were highly consistent.

Chapter 6:

General Discussion and Conclusions

Chapter Overview

The high demand for assistance dogs (ADs) has emphasised the importance of appropriate selection and training of AD candidates from puppyhood, to increase their chance of meeting high performance and behaviour standards. AD puppies typically live with volunteer raisers during a year-long puppy raising (PR) program to learn life skills and appropriate manners, after which time they may proceed to advanced training if they are suitable (Asher et al., 2017; Batt et al., 2010). Existing efforts to improve outcomes have focused on enrolling high-quality puppies (Asher et al., 2013; Takeuchi et al., 2009) and examining different program designs (Batt et al., 2008). However, PR programs often report high failure rates, with approximately 40% of all puppies eliminated at the end of a PR program in one study (Dollion et al., 2019), and up to 50% of all guide dog puppies failing to pass their final assessment to qualify as guide dogs in others (Tomkins et al., 2011; Wirth & Rein, 2008).

Puppy behaviour is influenced by genetics and environmental factors occurring at all stages of their development: prenatal, neonatal, transition, socialisation, juvenile, and pubertal periods (Serpell et al., 2016). Experienced breeders and AD organisations may have the expertise and resources to improve puppy behaviour and temperament by controlling factors during the first three stages of puppy development. However, the last three developmental stages, which are imperative to consolidate desirable traits and develop new adaptive behaviours (Fox, 1987; Rooney et al., 2016; Serpell et al., 2016; Woolpy & Ginsburg, 1967), fall within the management of volunteer puppy raisers. Raising AD puppies to high standards is clearly a demanding and prolonged undertaking. Despite the primary caring and managing roles of volunteer raisers for AD puppies, however, the nature and importance of the raisers' practices during PR programs has not received much research attention in the past.

To begin to address this situation, the overarching aim of this thesis was to understand the characteristics of successful PR, with success being defined in terms of both perceived puppy behaviour and raiser satisfaction. Two research questions were proposed, which focused on exploring predictors of puppy behaviour during the PR program, and identifying factors influencing raisers' engagement in recommended PR practices. It was also hypothesised (H_1) that raisers' practices would be amongst the predictors of puppy behaviour. If supported, this would suggest a holistic class of actions targeting factors affecting the raisers' practices in research question Q2, to directly improve raiser practices and potentially achieve puppies' desirable behaviour.

The following sections discuss how the findings in this thesis helped answer the two research questions. Since hypothesis H_1 was supported in Chapter 4, this chapter also discusses the potential application of a raiser-centred behavioural approach to PR to resolve both the puppy- and the raiser-specific issues. Implications and an evaluation of the research are discussed and recommendations made before the thesis concludes.

Answering the Research Questions

What are the Predictors of Puppy Behaviour during a PR Program, as Perceived by Puppy Raisers?

The first research question in this thesis was to explore predictors of perceived puppy behaviour, as puppy behaviour is a predominant outcome variable in current AD research and PR programs. As informed by the general PR model developed in Chapter 2, the studies in Chapters 3 and 4 looked beyond puppy factors and considered raiser-specific and contextual factors as candidate predictors of puppies' current behaviour. For example, Chapter 3 revealed several factors that experienced raisers and AD organisation staff perceived as helpful or unhelpful to the PR process. Those factors included raisers' personal differences (i.e., program expectations, competency, help-seeking behaviours, perseverance and passion);

informational and emotional support from program providers and those in the raisers' personal networks; and puppy characteristics. Although those findings did not directly demonstrate any effects on puppy behaviour, the emerging themes ensured the candidate factors were relevant to puppy behaviour and specific to the raisers' practices and program experiences.

Research in Chapter 4 built on these findings to quantitatively examine how those non-puppy factors related to each other and how the raisers rated their puppies' behaviour. The results from this quantitative study showed that, after controlling for puppy age, raisers' socialisation and training practices were the two variables that consistently appeared in models predicting most of the puppies' behaviour, namely trainability, general anxiety, adaptability, excitability, and distractibility. Thus, these findings supported hypothesis H₁, that raisers' practices would be among the best predictors of puppies' behaviour.

The only significant organisational support predictor was from puppy sitters who helped the raisers take care of the puppies on a short-term basis. Perceiving more support from those temporary supporters predicted lower raiser ratings of their puppies' excitability. Since the program providers typically assign puppy sitters, these findings may simply reflect the potential benefits of having more opportunities for puppies to socialise with people beyond their raisers' networks. Chapters 3 and 5 identified several other individuals, however, who also shared the PR responsibilities with raisers. These included family members, friends, and colleagues. This finding was in line with Chur-Hansen et al. (2015) regarding the involvement of such individuals in PR activities. It is possible that support practices (i.e., socialisation and training) from puppy sitters might have enabled them to influence the puppies' behaviour directly. It could also be that for raisers who received more support from puppy sitters, their puppies had more opportunity to socialise with a wider

range of people, hence they were rated as less excitable, which was the only puppy behaviour that was affected by this type of support.

Nevertheless, the benefits of support from puppy sitters on puppies' excitability could still be provided by the raisers. Raisers with higher ratings on their PR socialisation and training practices rated more favourably not only on puppies' excitability, but also puppies' trainability, general anxiety, adaptability, and distractibility. It is unlikely that competent puppy raisers would remain indifferent towards the ways in which others, including family members and puppy sitters when helping those raisers, would socialise and train their puppies. As part of the raisers' role, they are still expected to manage those aspects of their puppies' learning. Therefore, raisers' practices remains the key factors during the PR program that predicted most of puppy behaviours.

What are the Facilitators and Barriers to Raisers' Engagement in Recommended PR Practices?

In this thesis, the second research question was concerned with the nature of, and factors that affect, the raisers' practices. Chapters 3 through 5 adopted different approaches to conceptualising raisers' practices, but their findings were consistent regarding helpful and hindering factors affecting raisers' engagement in optimal PR practices.

In particular, the findings in this thesis suggest the influences of various contextual and puppy factors on raiser practices. For example, Chapter 3 revealed that organisational support provided both informational and emotional benefits to the raisers, substantiating the hierarchy in the general PR model in Chapter 2, in which organisational instructions were proposed to benefit the raisers' practices. Additional sources of support identified in Chapter 3 included other members at the AD organisation, the raisers' family members, their friends, and colleagues. Amongst those support sources, Chapter 4 found that only experienced raisers, or mentors, predicted any improvement in the raisers' socialisation and training

practices. Although informal sources of support from the raisers' personal networks did not predict any improvement in the raisers' PR practices, those individuals might have provided the raisers with emotional support; this factor, however, was not measured the study in Chapter 4. Meanwhile, the benefits of mentors' support to the raisers' PR practices could be attributable to their ability to effectively delivery organisation-specific instructions to the raisers. Specifically, Chapter 4 found that the benefits of mentors' support were due to the ability of this support type to promote the raisers' help-seeking behaviour, and the raisers who sought help were also the ones who rated more highly on their puppy socialisation and training practices. These findings suggest that raisers are active recipients of support, who also determine the type and amount of support needed to benefit their PR practices.

Additional to the effects of raisers' practices on puppies' behaviour, as evident in Chapter 4, qualitative studies in Chapters 3 and 5 suggested some benefits from having easy-going puppies and the negative impacts of raising high energy puppies on raisers' practices. For example, raisers in Chapter 3 attributed positive experiences to their puppies' laid-back temperament, while distracted and high energy puppies in Chapter 5 discouraged their raisers from providing socialisation opportunities to the puppies. In addition, raisers' perception of puppies as a nuisance was reported as a reason for their negative PR experiences in past research (Chur-Hansen et al., 2015).

The influences of contextual and puppy factors on raisers' practices were consistent with family-centred research in human development. In a child developmental study, Kelly and Coughlan (2019) interviewed parents about facilitators and barriers to their children's recovery from mental health issues. In this study, parents, as key stakeholder and joint decision-makers of mental health services for their children, reported that parents' efforts and relationships with their children facilitated their children's recovery. Several benefits from professional mental health services included provision of information on the child's mental

health condition, communication and rapport amongst professionals, parents, and children. Other contextual factors included messages from the media and levels of understanding from the child's school. Professionals and other contextual factors were revealed as both facilitators and barriers depending on the nature of their interactions with both the parents and their children.

The parents in Kelly and Coughlan (2019) played a crucial role in determining the type and amount of mental health services accessed and they regulated the impacts of various contextual factors on their children's mental health recovery. This role appears analogous to PR practices, whereby raisers help improve their puppies' behaviour (akin to parents) by complying with instructions from organisations and accessing various contextual forms of support (akin to mental health services). This high resemblance suggests a potential for our understanding of PR practices to benefit from relevant evidence and practices from this well-established area of research in parenting practices. Similar to the parent-centred approach in child development research, PR research may develop raiser-centred program interventions that enable the raisers to improve their practices and their puppies' behaviour.

A Raiser-Centred Behavioural Approach to Successful PR

Since hypothesis H₁ was supported in that raisers' puppy socialisation and training practices predicted perceived puppy behaviour, any efforts to improve raisers' practices might potentially benefit their puppy's behaviour. Due to the non-experimental design, the findings in this thesis could not suggest any causal relationships between raisers' practices and puppy behaviour. Instead, their relationships have been argued as bidirectional, whereby puppy behaviour may benefit from and also affect their raiser's PR practices, also known as the Child Effects from a human Family Dynamics perspective (Bell, 1968; Cummings & Schermerhorn, 2003; Schermerhorn & Cummings, 2008). However, the raiser-puppy dynamics when perceived from a Family Systems perspective (e.g., parent-child interactions,

Cox & Paley, 1997; Schermerhorn & Cummings, 2008), suggests a potential for utilising behavioural support programs, focusing on the raisers to break any unhealthy patterns in their PR patterns that may disadvantage their puppy's training progress. Essentially, it requires the raisers to change their puppy raising practices towards recommended practices or target behaviours, suggesting the potential for implementing behavioural interventions.

Behavioural intervention refers to a process by which a set of actions are performed to increase the likelihood of an individual exhibiting a target behaviour or a conflicting behaviour to reduce the target behaviour (Michie et al., 2011). Although puppy behaviour remains an essential component of a PR program, behaviour changes in the following discussion are aimed at the raiser level and not the puppies' expected behavioural training progress. This focus on the raisers' behaviour reflects the above discussed potential for promoting healthy raisers' PR patterns, which could benefit the raisers' program experiences and their puppies' training progress.

This section introduces a robust behaviour framework called the Behavioural Change Wheel (BCW, Michie et al., 2011), which has guided the successful development of behavioural interventions for human parents through parenting intervention programs (e.g., Dong et al., 2020; Murtagh et al., 2018; Musgrave et al., 2021; Toomey et al., 2020), and through promoting family-centred support programs for individuals with a disability (Ekberg et al., 2020), and peer-support programs to promote mother's breastfeeding practices (Phillips et al., 2018). This section then adapts the BCW framework to propose a model for raisers-centred behaviour support programs aimed at promoting raisers' successful PR practices.

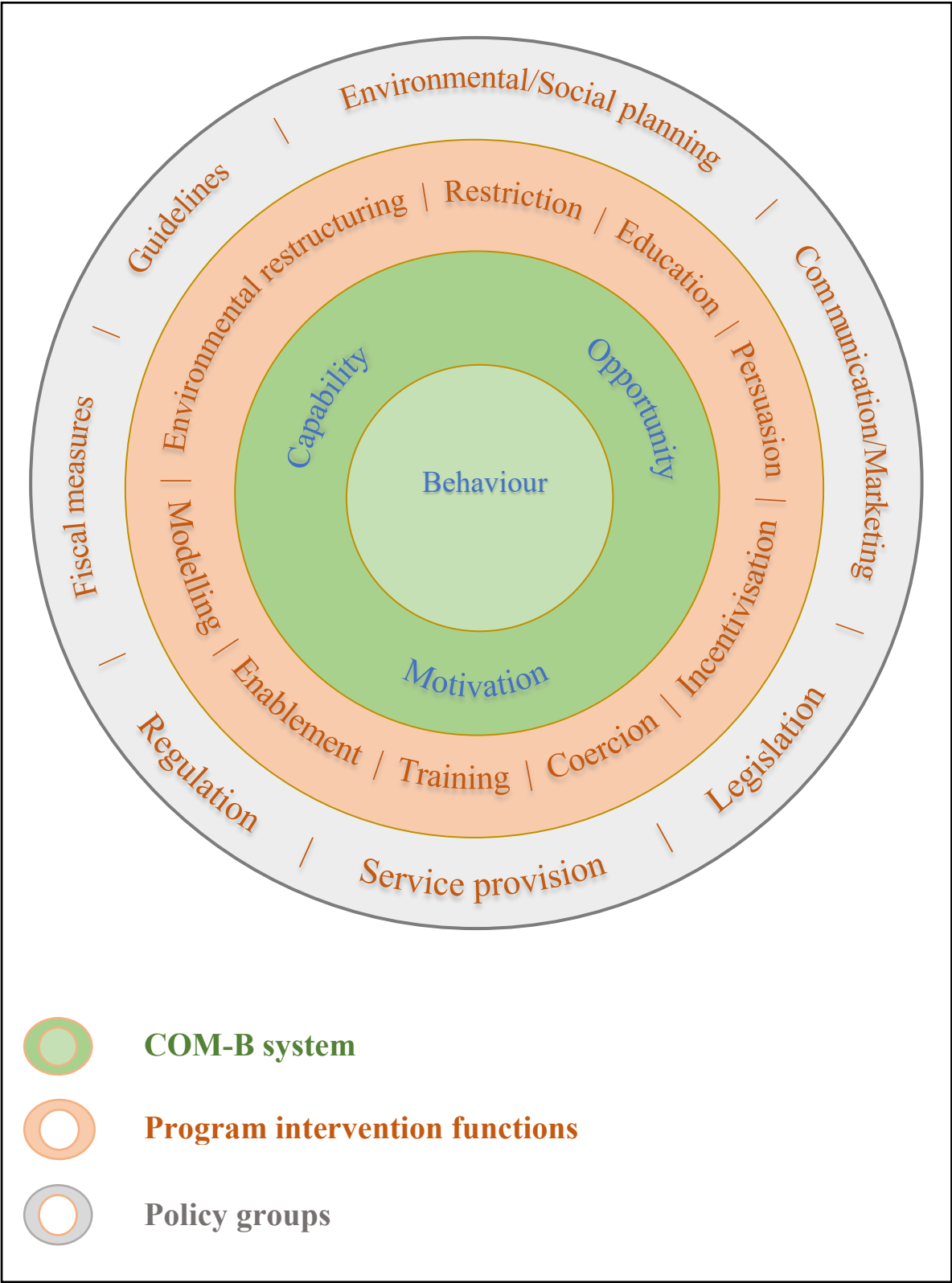
The Behavioural Change Wheel

The Behaviour Change Wheel (BCW) was synthesised from 19 behaviour theories, models, and frameworks (Michie et al., 2011). Central to this model is the COM-B system, which is surrounded by nine intervention functions in the middle layer, and seven policy

groups in the outermost layer (see Figure 6.1). At the core, the COM-B system proposes three conditions for behavioural changes to occur: capability, opportunity, and motivation. In other words, for an individual to perform a target behaviour (B), they need to have the capability (C) to perform it given the right opportunity (O), and motivation (M) to carry out that behaviour. For instance, puppy raisers bringing their puppies to a shopping mall for socialisation is a behaviour (B) that requires the raisers' knowledge and physical capability to perform the task (C), time and access to the shopping mall (O), and the motivation to socialise the puppy in the shopping mall (M).

Figure 6.1

The COM-B System and the BCW Model, Adapted from Michie et al. (2011)



The middle layer of the BCW comprises nine functions of behaviour intervention programs linked to the capability, opportunity, and motivation conditions of the COM-B system (Michie et al., 2011). The outermost layer lists seven policy categories – the highest level of influence where peak bodies and governing authorities regulate their member organisations to promote or reduce certain behaviours at the individual level. Since the evidence in this thesis is limited to how organisations may help their raisers to engage in expected PR practices, this section will not discuss the seven policy categories and will instead focus on the COM-B system and the nine intervention functions of the BCW. Future research is needed to suggest the relevance of any industry-level recommendations. Definitions of the nine intervention functions are presented in Table 6.1, together with puppy-raising specific examples.

Table 6.1*Definitions of BCW Functions and PR Examples*

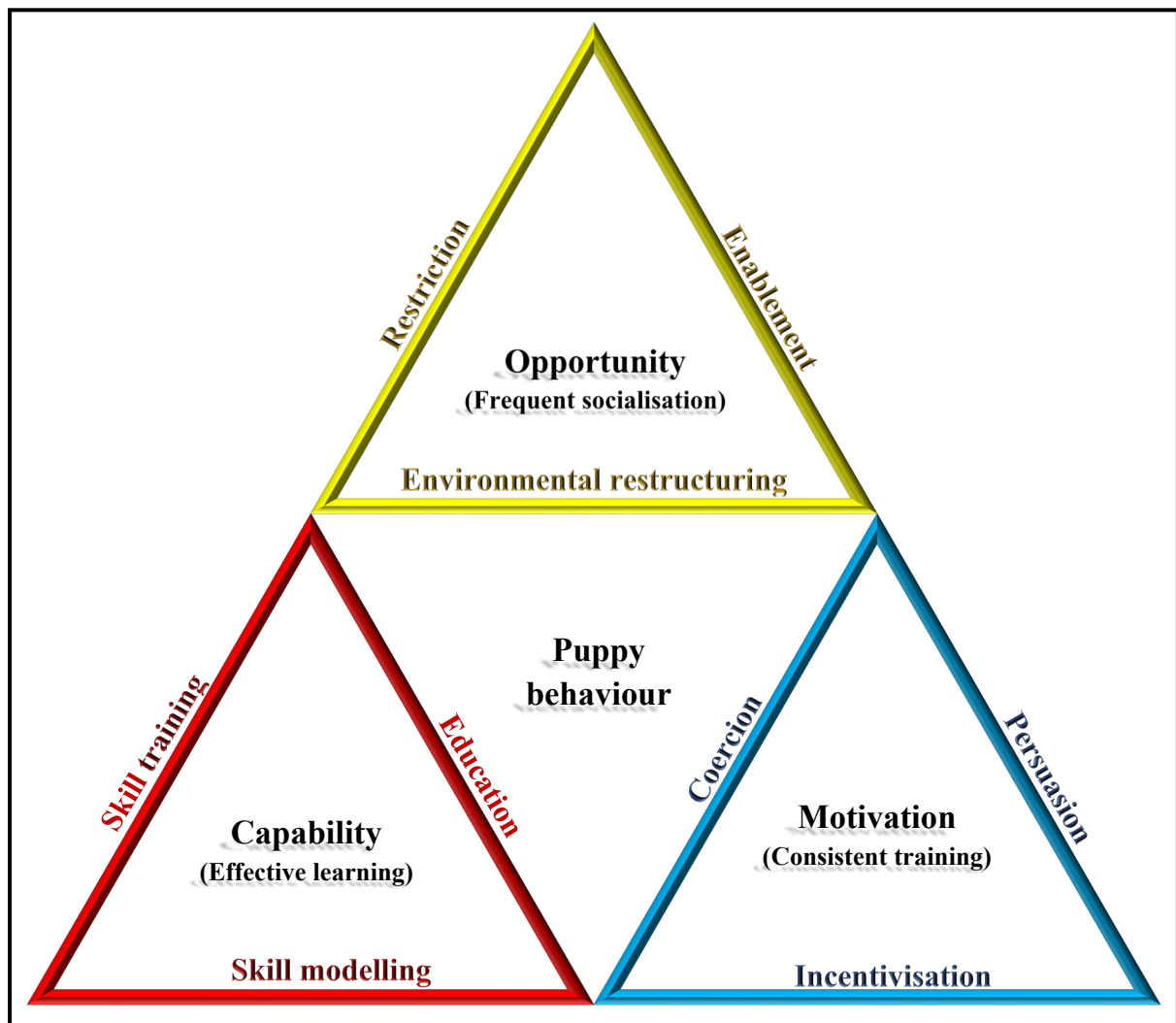
Descriptions from Michie et al. (2011)		PR Examples
Interventions	Definition	
Education	Increasing knowledge or understanding	Providing knowledge about puppy socialisation, puppy training and different modalities of ongoing learning for raisers.
Persuasion	Using communication to induce positive or negative feelings or stimulate action	Demonstrating effectiveness of appropriate and sufficient socialisation and training on puppy behaviour.
Incentivisation	Creating expectation of reward	Extending appreciations of raisers' socialisation and training efforts or including raisers in puppies' graduation ceremonies.
Coercion	Creating expectation of punishment or cost	Highlight the cost associated with failing a puppy and added waiting time for potential handlers.
Training	Imparting skills	Analytical skills and specific dog handling techniques.
Restriction	Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)	Limit access to areas with potential risks (e.g., local parks with aggressive dogs) while promoting access to public places with age-appropriate stimuli.
Environmental restructuring	Changing the physical or social context	Adapt workplace environment so the raisers could bring their puppies to work, educate the public to refrain from distracting the puppies.
Modelling	Providing an example for people to aspire to or imitate	Peer-learning with experienced and competent puppy raisers.
Enablement	Increasing means/reducing barriers to increase capability or opportunity ¹	Access to trained puppy helpers who carry out puppy socialisation and training tasks that raisers do not/cannot perform, or in places and at times that are inconvenient to the raisers.

Note: ¹Capability beyond education and training; opportunity beyond environmental restructuring (Michie et al., 2011).

A behaviour support program may aim to achieve all nine functions and their associated strategies depending on the circumstances of the specific raiser-puppy team. For instance, while focusing on providing training to the puppy raisers (e.g., analytical skills and specific dog handling techniques), program providers may also restrict the raisers' access to local areas with known aggressive dogs (i.e., restriction). The PR organisation may also collaborate with the raisers' employment to accommodate the puppies at their workplace (i.e., environmental restructuring) and offer extra assistance from competent dog helpers who could provide supplementary or special socialisation and training sessions for the puppies when the raisers are not available or incapable of doing so (i.e., enablement). For some raisers, restrictions concerning contact with aggressive dogs may not be relevant in their local settings. Instead, they may need restrictions around approaching small animals to avoid developing walking misbehaviours such as pulling on the leash, barking, and/or chasing. As the raisers and program providers agree on a specific goal for their puppies (e.g., increasing socialisation for timid puppies), they may decide on a behavioural intervention program to ensure the raisers could achieve this goal. The development of such a behaviour support plan should be individualised to suit the raiser's circumstances and the puppies' training requirements.

The Triple Triangle (3T) Model - A Holistic Approach to Improving Raisers' PR

As discussed above, the COM-B model and the nine intervention functions of the BCW framework provide a general approach to promote an individual's engagement in target behaviours, with specific illustrations from the PR context. This section proposes a raiser-centred behavioural support framework, called the Triple Triangle (3T) model (see Figure 6.2), which was adapted from the BCW's individual- and program-level concepts to be specific to the findings in this thesis.

Figure 6.2*The Triple Triangle (3T) Model for PR*

As the name suggests, the model encompasses three individual triangles representing the Capability, Opportunity, and Motivation conditions in the COM-B system. The three triangles form a larger overarching triangle representing the holistic approach to improving raisers' practices. The edges of the three triangles refer to the program functions to promote the COM-B condition that the respective triangle represents. For instance, to provide suitable opportunities for raisers to engage in a recommended behaviour, program providers may consider strategies relevant to environmental restructuring, enablement, and/or restriction functions. All nine functions are represented by the three triangles.

In the 3T model, each component triangle also targets one of the three raisers' practices, namely frequent socialisation, consistent training, and effective learning. Therefore, when combining the COM-B components, this 3T model aims to promote opportunities for puppy socialisation, increased capability through the raisers' learning activities, and strong motivation for conducting consistent puppy training. Although all three conditions are necessary to promote a target behaviour, the assignment of three raisers' practices to those distinct triangles suggest their higher relevance to each of the COM-B components.

For instance, providing raisers with training is necessary to ensure they can conduct puppy-focused practices (i.e., puppy socialisation and puppy training). Successfully performing those tasks requires appropriate education, skill training, and skill modelling—the three edges of the Capability triangle. The findings in Chapter 5 showed that having training instructions available in various modalities would be helpful to suit raisers' preferred learning styles. The skill modelling function was repeatedly supported by the current findings, in which raisers preferred support from experienced puppy raisers (Chapters 3 and 4) and accrued benefits from learning from other puppy raisers (Chapter 5). In brief, when aiming to enhance raisers' capability, the raisers' learning should be considered as the direct target behaviour.

The Opportunity triangle is concerned with functions associated with raisers' puppy socialisation practices. Providing the puppies with more socialisation sessions appears to rely mostly on raisers' having opportunities to perform this task. PR programs may consider strategies focusing on environmental restructuring, enablement, and/or restrictions to increase socialisation opportunities—the three edges of the Opportunity triangle. As revealed in Chapter 5, raisers reported that their puppies would receive more socialisation when their workplace had policies and equipment in place so they could bring the puppies to work (environmental restructuring). Similarly, the benefits reported in Chapter 5, concerning

puppy socialisation from having supplementary supports from other family members, colleagues, and trained puppy socialisers, reflect the enablement function of the Opportunity triangle.

The last triangle is Motivation, which, in the PR context, primarily refers to the raisers' engagement in consistent puppy training. Assuming that raisers have the necessary skills and competency, and opportunities to facilitate frequent socialisation and training sessions with their puppy, it would be ideal for raisers to consistently adhere to program-specific instructions and perform the recommended training techniques. When the target behaviour is concerned with program fidelity, the remaining condition is that the raisers have the motivation to perform the instructed dog training techniques during their puppy socialisation and training activities. This motivation can be enhanced as the raisers perceive sufficient incentivisation, persuasion, or coercion associated with the tasks at hand. In Chur-Hansen et al.' (2015) study, raisers reported producing successful puppies for future handlers and opportunities to enhance their families dynamics as motivations to join the PR program and help the puppies' learning. In contrast, motivation to engage in competing and restricted behaviour relative to the organisation-specific training rules should be discouraged. The findings in Chapter 3 revealed that, in some programs where raisers get to keep unsuccessful puppies, if the raisers were reluctant to return the puppy, they might be tempted engage in unrecommended practices to purposely fail their puppy.

Although the coercion function aims to prevent undesirable practices, program providers should be aware of potential external factors that prevent their raisers from performing instructed tasks. For example, raisers in Chapter 5 reported perceiving negative judgements of some training techniques by members of the public, which weighed down their motivation to engage in puppy training in public places. A similar sentiment was also reported in Chur-Hansen et al.'s (2015) study regarding contradicting public opinions on the

training regime. This finding implies the coercion effects on the raisers' performing consistent puppy training, whereby perceived judgement from others becomes a punishment to adhere to the recommended PR practices, and thus it is worthy of consideration from program providers. Thus, the three edges of this triangle (Motivation) may motivate raisers to carry out the training that they already know (Capability) given the right conditions (Opportunity).

In short, the 3T model presents three triangles representing the three COM-B conditions to promote behaviour change, namely Capability, Opportunity, and Motivation. Each condition targets one of the PR practices, namely effective learning, frequent socialisation, and consistent training, respectively. The three edges of each triangle represent the program functions required to enhance each condition that the triangle represents. The larger triangle refers to the interconnectedness of different PR practices and their underlying behavioural principles. Central to the model are puppy characteristics, with this emphasising the ultimate purpose of the PR program – to produce a puppy with desirable behaviour and temperament, who is healthy and who can perform the tasks relevant to her future assistance role.

Practical Implications and Recommendations

This thesis has several practical implications for different individuals involved in PR practices and for program providers. PR programs typically involve several different stakeholders: the raisers and their household members, their friends and workplace colleagues; members of the public; mentors and supporters; and staff from the host organisation. Therefore, the practical implications of this thesis correspond to those stakeholders, with clear recommendations emerging from the findings.

Prospective raisers should seek clarification of the tasks, what is required of them, the skills and resources they already have, and available organisational support when considering

this role. Interested volunteers may perceive potential benefits when they sign up. However, upon commencing the program, high expectations for raising successful puppies require long-term commitment and efforts that may exceed their expectations. In those circumstances, they should actively seek advice and assistance from staff and those with more experience at their organisation. While ongoing learning equips raisers with appropriate knowledge and skills, it helps their puppies when the raisers arrange convenient and enjoyable opportunities for their puppies' socialisation, and when they persevere and are consistent with the instructed training regime.

For the same reasons, household members should join the prospective raisers in the decision-making process to raise a puppy. They should be aware of their influence on both the raiser and the puppy. During the PR program, household members are likely to be in close contact with, and involved in the training of, the puppies. Simply being understanding and respectful of the training that the raisers may implement at home would be helpful. However, with skills, knowledge, and active involvement in the program, household members may share the raising responsibilities and help the raisers fulfil their commitment.

The raiser's friends and colleagues can be less involved in PR than the raiser's household members. However, they may show understanding for the raiser's volunteering commitment and perhaps assist when the raisers bring the puppies to social events and the workplace. Friends, colleagues, and the raiser should establish boundaries to minimise any negative impacts on themselves, the puppy, and their social and workplace dynamics.

Members of the public may enjoy the presence of AD puppies, appreciate the raisers' volunteer commitment or hold personal opinions about the training of the puppies. While appropriate social interactions may be welcomed by the raisers and helpful to the puppies' socialisation, unsolicited encounters may excite friendly puppies and surprise or frighten timid ones. When raisers are in a hurry and only plan for a short trip in public places with

their puppy, being stopped by friendly and curious public members may unnecessarily and inconveniently prolong the raisers' trips. Therefore, it is recommended that members of the public refrain from approaching puppies directly and always ask permission from raisers prior to any engagement. Furthermore, members of the public may disagree with how the puppies are trained, which may arise from their concern for the puppies' welfare or the perceived ineffectiveness of the training technique. Public concerns and constructive feedback are essential to the sustainability of the working dog industry (Cobb et al., 2015). However, given that raisers are volunteers expected to execute the programs as instructed, public concerns should, instead, be directed to the responsible staff at the program provider. This recommendation excludes situations where a puppy's welfare is genuinely compromised and the threat is imminent, of course. Otherwise, beginning a conversation about a potentially controversial topic (e.g., training styles) with the raisers may counter the efforts and motivations of those volunteers.

Experienced raisers and supporters (e.g., sitters and socialisers) should be aware of their positive impact on other puppy raisers, especially novices. They are amongst the individuals who could promote raisers' help-seeking behaviours, provide their peers with technical and emotional support, and with more active involvement, they may also contribute to the improvement of puppies' behavioural outcomes.

Staff responsible for raisers' training should consider several aspects of the raisers' lives, as those factors may counter both the raisers and the organisation's efforts.

Administratively, program providers should assess risks and hazards associated with the raisers' fitness, living environments, and local and work settings. For instance, there are many potential risks to raisers, members of the public, and puppies, if physically unsuitable raisers are required to handle physically strong and highly distractible or excitable puppies in highly stimulating settings. Given the support available within the raisers' personal networks

(e.g., household members, friends, colleagues in the PR program), staff should involve and formally acknowledge the contribution of those individuals. In terms of program design, PR providers should focus their support on ensuring raisers' engagement in ongoing effective learning, creating convenient opportunities for raisers to offer their puppy sufficient socialisation experiences, and adhering to program-specific instructions. This thesis devised a behavioural intervention PR model targeting these three PR practices, named the 3T model, with nine specific program functions to guide program providers when devising specific program strategies for individual raisers and organisation-wide. This theory-informed support model provides organisations with a framework to explain the interconnectedness of PR factors and suggests program outcome criteria for evaluation of their support programs.

Limitations and Future Directions

This thesis directs research attention to raiser-related factors and opens future avenues for further research in this direction. However, the restricted duration of a PhD candidature and constraints on available resources limited the design and execution of research in this thesis. First, the qualitative study in Chapter 3 allowed for an in-depth understanding of the research topic, though the in-depth nature of the study limited the sample size, as is typical in qualitative research (Braun & Clarke, 2006; Thomson, 2010). This issue was also relevant to the longitudinal qualitative study in Chapter 5. This study was made possible with support from a partner program provider who agreed to implement their existing PR program, providing all equipment and technical support required for the participants in this study. Though the sample size of this study was limited to only eight participants, it included the collection and analysis of a large amount of longitudinal qualitative data. Since both Chapters 3 and 5 prioritised the benefits of in-depth knowledge and rich data from their constructivist approach, the generalisability of these findings is limited.

Although Chapter 4 recruited a larger sample size to compensate for this limitation in Chapter 3, Chapter 4 was only able to develop and demonstrate the psychometric properties of the raiser practice questionnaire when examining relationships between raiser practice components and raisers' ratings of puppy behaviour. Support factors were measured using single rating items, allowing for limited variance within those measures and not accounting for different functions of those support sources. Therefore, future research should explore this in more depth to identify the constructs or functions of different social support factors and develop objective measures for those social support variables. Research may reveal the roles of different aspects or types of organisational support to inform future investment for program providers. Other supports may be organic within the raisers' ecological environment, such as their family, household members, or friends. Therefore, understanding the different dimensions and effects of those sustainable social support sources will help promote effective raisers' practices and program retention.

The self-reported cross-sectional data in Chapter 4 has some inherited weaknesses, such as sampling bias and bias in responses toward social desirability, as trade-offs for quick and confidential participant recruitment (Borman, 1991; Donaldson & Grant-Vallone, 2002; Moorman & Podsakoff, 1992). It would be ideal to follow up with the participants in Chapter 4 to examine the temporal stability of the observed relationships between variables. In addition, although the survey method in Chapter 4 allowed for a large sample size, which strengthened its reliability, the measures were subjective, and its design did not allow for inferences of causal effects from the findings. Future researchers should consider incorporating evidence-based support programs for raisers and objective measures of their practices (i.e., frequency of socialisation, training consistency, and ongoing learning). Ideally, program interventions provided to the raisers should be informed by an established framework, such as the BCW (Michie et al., 2011) or its adapted version – the 3T model

(refer to Figure 6.2). In terms of data collection, some program providers might already employ a logbook to supervise the raisers' PR-related activities, which demonstrates the practicality of this data collection method. This type of data may be more objective than the self-report data employed in this thesis. Therefore, future research designs may incorporate logbook activities and collection of frequency data.

It is recommended that future research consider employing empirical methods, such as a randomised controlled trial with specific program interventions and objective measures for raisers' practices, with baseline and recurring objective measures of puppies' behaviour. Such experimental designs will help overcome the limitations of the current design by allowing for inferences of any causal relationships found between those variables. This will be difficult to achieve, however. Besides the evidence-based interventions and objective measures of raisers' practices discussed above, observations and standardised behaviour tests for the puppies should be conducted by trained personnel or independent researchers. Experimental designs with objective measures and evidence-based intervention models will ensure higher levels of internal validity. Such designs may be costly and require small sample sizes from specific programs, though further replications may corroborate their conclusions.

The participatory action nature in the PR program in Chapter 5 might have limited the objectivity of its findings. This form of research refers to participants' active role in the research process and as agents of change to the situations concerning their lives (i.e., participation), and refers to researchers' active engagement in and learning from the participants' experiences as they occur in real-life settings (i.e., action; Brydon-Miller, 1997; Bull et al., 2019). These participatory action features enhanced my rapport with the raiser participants and ensured the raisers' positive experiences, an issue that was raised in past research (Chur-Hansen et al., 2015). To guard against this, during the data collection stage I summarised and reported any feedback and recommendations from the raisers in my weekly

PhD supervisions. The discussions were conducted in confidence without any references to particular raisers. Separate meetings took place between my supervisors and the program provider to discuss any necessary improvements within the provider's capacity. This procedure was ethically appropriate and helpful for data collection. However, the subjectivity inherent in this research design requires that readers and program providers interpret the findings with caution.

In short, considering the overall research presented in this thesis, it is evident that the different methodologies and methods adopted in the individual studies allowed for triangulation that complemented and reinforced the findings in each study. However, further understanding of human factors with empirical designs and objective measures of various PR factors may inform program providers of more effective operating models that ensure the efficiency of their investments, positive program experiences for their raisers, higher puppy success rates, and more ADs to meet the demands of waiting handlers.

Conclusions

Research in this thesis adopted a systems-level perspective to further the understanding of both human and puppy outcomes of PR programs. Not only did this thesis report the influence of various factors that influence raisers' PR practices, but it was also the first to demonstrate direct relationships between raisers' practices and their ratings of puppy behaviour. Raisers are volunteers with a long-term commitment to the raising program. Therefore, their subjective program experiences are noteworthy, especially when integrating a puppy, and program-specific instructions may create some tension in their daily living. Contextual factors such as different sources and types of support, influence raisers' practices. However, the extent to which raisers benefit from those factors also depends on their help-seeking behaviour and compatibility of available support with their preferred learning modalities. Raisers may learn new skills to properly handle their puppies during formal

training, though many organic factors in the raisers' daily living determine the nature, occurrence, and perpetuation of their PR practices. Consequently, as a function of their learning and experiences being managed by their raisers, puppy behaviour depends critically on raisers' practices. Thus, successful PR may be promoted via a raiser-centred behavioural support approach to improving raiser practices, potentially benefiting the puppy's behavioural outcomes.

References

- About us.* (2019). Assistance Dogs International. Retrieved 21/03/2019 from <https://assistancedogsinternational.org/about/who-we-are/>
- Americans with Disabilities Act Title III Regulations.* (2017). United States Department of Justice Civil Rights Division.
https://www.ada.gov/regs2010/titleIII_2010/titleIII_2010_regulations.htm
- Asher, L., Blythe, S., Roberts, R., Toothill, L., Craigon, P. J., Evans, K. M., Green, M. J., & England, G. C. W. (2013). A standardized behavior test for potential guide dog puppies: Methods and association with subsequent success in guide dog training. *Journal of Veterinary Behavior*, 8(6), 431-438.
<https://doi.org/10.1016/j.jveb.2013.08.004>
- Asher, L., Harvey, N. D., Green, M., & England, G. C. W. (2017). Application of survival analysis and multistate modeling to understand animal behavior: Examples from guide dogs. *Frontiers in Veterinary Science*, 4, 116.
<https://doi.org/10.3389/fvets.2017.00116>
- Attribution 4.0 International (CC BY 4.0).* (n.d.). Creative Commons. Retrieved 27/05/2021 from <https://creativecommons.org/licenses/by/4.0/legalcode>
- Batt, L., Batt, M., Baguley, J., & McGreevy, P. (2010). Relationships between puppy management practices and reported measures of success in guide dog training. *Journal of Veterinary Behavior*, 5(5), 240-246.
<https://doi.org/10.1016/j.jveb.2010.02.004>
- Batt, L. S., Batt, M. S., Baguley, J. A., & McGreevy, P. D. (2008). The effects of structured sessions for juvenile training and socialization on guide dog success and puppy-raiser participation. *Journal of Veterinary Behavior*, 3(5), 199-206.
<https://doi.org/10.1016/j.jveb.2008.05.001>

- Bell, R. Q. (1968). A reinterpretation of the direction of effects in studies of socialization. *Psychological Review*, 75(2), 81-95. <https://doi.org/10.1037/h0025583>
- Borman, W. C. (1991). Job behavior, performance, and effectiveness. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 271–326). SAGE.
- Boulding, K. (1956). General systems theory—The skeleton of science. *Management Science*, 2(3), 197-208. <https://www.jstor.org/stable/2627132>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Bremhorst, A., Mongillo, P., Howell, T., & Marinelli, L. (2018). Spotlight on assistance dogs—Legislation, welfare and research. *Animals*, 8(8), 129-129. <https://doi.org/10.3390/ani8080129>
- Brydon-Miller, M. (1997). Participatory action research: Psychology and social change. *Journal of Social Issues*, 53(4), 657-666. <https://doi.org/10.1111/j.1540-4560.1997.tb02454.x>
- Bull, E. R., Hart, J. K., Swift, J., Baxter, K., McLauchlan, N., Joseph, S., & Byrne-Davis, L. M. T. (2019). An organisational participatory research study of the feasibility of the behaviour change wheel to support clinical teams implementing new models of care. *BMC Health Services Research*, 19(1), 97. <https://doi.org/10.1186/s12913-019-3885-8>
- Champagne, F. A. (2008). Epigenetic mechanisms and the transgenerational effects of maternal care. *Frontiers in Neuroendocrinology*, 29(3), 386-397. <https://doi.org/10.1016/j.yfrne.2008.03.003>

- Chur-Hansen, A., Werner, L. K., McGuiness, C. E., & Hazel, S. (2015). The experience of being a guide dog puppy raiser volunteer: A longitudinal qualitative collective case study. *Animals*, 5(1), 1-12. <https://doi.org/10.3390/ani5010001>
- Cobb, M., Branson, N., McGreevy, P., Lill, A., & Bennett, P. (2015). The advent of canine performance science: Offering a sustainable future for working dogs. *Behavioural Processes*, 110, 96-104. <https://doi.org/10.1016/j.beproc.2014.10.012>
- Cooke, B. J., & Farrington, D. P. (2016). The effectiveness of dog-training programs in prison: A systematic review and meta-analysis of the literature. *The Prison Journal*, 96(6), 854-876. <https://doi.org/10.1177/0032885516671919>
- Copyright. (n.d.). Elsevier. Retrieved 27/05/2021 from <https://www.elsevier.com/about/policies/copyright>
- Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, 48(1), 243-267. <https://doi.org/10.1146/annurev.psych.48.1.243>
- Creswell, J. D., & Plano Clark, V. L. (2011). Choosing a mixed methods design. In *Designing and Conducting Mixed Methods Research* (2nd ed., pp. 53-106). SAGE Publications.
- Cummings, E. M., & Schermerhorn, A. C. (2003). A developmental perspective on children as agents in the family. In *Handbook of dynamics in parent-child relations* (pp. 91-108). Sage Thousand Oaks, CA.
- Disability Discrimination Act 1992. (2011). Office of Legislative Drafting and Publishing, Attorney-General's Department. Retrieved 16 July 2020 from <https://www.legislation.gov.au/Details/C2012C00110>
- Dollion, N., Paulus, A., Champagne, N., St-Pierre, N., St-Pierre, E., Trudel, M., & Plusquellec, P. (2019). Fear/Reactivity in working dogs: An analysis of 37 years of

- behavioural data from the Mira Foundation's future service dogs. *Applied Animal Behaviour Science*, 221, 104864. <https://doi.org/10.1016/j.applanim.2019.104864>
- Donaldson, S. I., & Grant-Vallone, E. J. (2002). Understanding self-report bias in organizational behavior research. *Journal of Business and Psychology*, 17(2), 245-260. <https://doi.org/10.1023/A:1019637632584>
- Dong, L., Fine, E. R., Michie, S., Zhou, Q., Mullin, A. C., Alvarado-Martinez, C. G., Hilmoe, H. E., Tran, M., & Harvey, A. G. (2020). Open trial of the Parent Behavior Change Intervention (PBC-I): Study protocol. *Health Psychology*, 39(9), 785-795. <https://doi.org/10.1037/hea0000873>
- Ekberg, K., Timmer, B., Schuetz, S., & Hickson, L. (2020). Use of the Behaviour Change Wheel to design an intervention to improve the implementation of family-centred care in adult audiology services. *International Journal of Audiology*, 60(sup2), 20-29. <https://doi.org/10.1080/14992027.2020.1844321>
- Fox, M. W. (1987). *The dog: its domestication and behavior*. Garland STPM Press.
- Fratkin, J. L., Sinn, D. L., Patall, E. A., & Gosling, S. D. (2013). Personality consistency in dogs: A meta-analysis. *PloS One*, 8(1), e54907. <https://doi.org/10.1371/journal.pone.0054907>
- Goddard, M. E., & Beilharz, R. G. (1982). Genetic and environmental factors affecting the suitability of dogs as guide dogs for the blind. *Theoretical and Applied Genetics*, 62(2), 97-102. <https://doi.org/10.1007/BF00293339>
- Kelly, M., & Coughlan, B. (2019). A theory of youth mental health recovery from a parental perspective. *Child and Adolescent Mental Health*, 24(2), 161-169. <https://doi.org/10.1111/camh.12300>
- Lahman, M. P. (2018). By my side: The university's first service dogs. *Health Communication*, 33(2), 222-224. <https://doi.org/10.1080/10410236.2016.1250185>

- Maccoby, E. E. (1984). Socialization and developmental change. *Child Development*, 55(2), 317-328. <https://doi.org/10.2307/1129945>
- Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2020). Raising an assistance dog puppy—Stakeholder perspectives on what helps and what hinders. *Animals*, 10(1), 128. <https://doi.org/10.3390/ani10010128>
- Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2021a). Beyond puppy selection—considering the role of puppy raisers in bringing out the best in assistance dog puppies. *Journal of Veterinary Behavior*, 42, 1-10. <https://doi.org/10.1016/j.jveb.2020.11.002>
- Mai, D., Howell, T., Benton, P., & Bennett, P. C. (2021b). Socialisation, training, and help-seeking—specific puppy raising practices that predict desirable behaviours in trainee assistance dog puppies. *Applied Animal Behaviour Science*, 236, 105259. <https://doi.org/10.1016/j.applanim.2021.105259>
- Mai, D., Howell, T., Benton, P., Lewis, V., Evans, L., & Bennett, P. C. (2021c). Facilitators and barriers to raisers' engagement in recommended assistance dog puppy raising practices. *Animals*, 11(5), 1195. <https://doi.org/10.3390/ani11051195>
- Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6(1), 42. <https://doi.org/10.1186/1748-5908-6-42>
- Moorman, R. H., & Podsakoff, P. M. (1992). A meta-analytic review and empirical test of the potential confounding effects of social desirability response sets in organizational behaviour research. *Journal of Occupational and Organizational Psychology*, 65(2), 131-149. <https://doi.org/10.1111/j.2044-8325.1992.tb00490.x>
- Murtagh, E. M., Barnes, A. T., McMullen, J., & Morgan, P. J. (2018). Mothers and teenage daughters walking to health: Using the behaviour change wheel to develop an

- intervention to improve adolescent girls' physical activity. *Public Health*, 158, 37-46.
<https://doi.org/10.1016/j.puhe.2018.01.012>
- Musgrave, L. M., Baum, A., Perera, N., Homer, C. S. E., & Gordon, A. (2021). Baby buddy app for breastfeeding and behavior change: Retrospective study of the app using the Behavior Change Wheel. *JMIR Mhealth Uhealth*, 9(4), e25668.
<https://doi.org/10.2196/25668>
- Phillips, R., Copeland, L., Grant, A., Sanders, J., Gobat, N., Tedstone, S., Stanton, H., Merrett, L., Rollnick, S., Robling, M., Brown, A., Hunter, B., Fitzsimmons, D., Regan, S., Trickey, H., & Paranjothy, S. (2018). Development of a novel motivational interviewing (MI) informed peer-support intervention to support mothers to breastfeed for longer. *BMC Pregnancy and Childbirth*, 18(1), 90.
<https://doi.org/10.1186/s12884-018-1725-1>
- Rooney, N. J., Clark, C. C. A., & Casey, R. A. (2016). Minimizing fear and anxiety in working dogs: A review. *Journal of Veterinary Behavior*, 16, 53-64.
<https://doi.org/10.1016/j.jveb.2016.11.001>
- Schermerhorn, A. C., & Cummings, E. M. (2008). Transactional family dynamics: A new framework for conceptualizing family influence processes. In R. V. Kail (Ed.), *Advances in Child Development and Behavior* (pp. 187-250). Elsevier Academic Press. [https://doi.org/10.1016/S0065-2407\(08\)00005-0](https://doi.org/10.1016/S0065-2407(08)00005-0)
- Scott, J. P. (1963). The process of primary socialization in canine and human infants. *Monographs of the Society for Research in Child Development*, 28(1), 1-47.
<https://doi.org/10.2307/1165508>
- Serpell, J., Duffy, D. L., & Jagoe, J. A. (2016). Becoming a dog: Early experience and the development of behavior. In J. Serpell (Ed.), *The domestic dog: Its evolution*,

- behavior and interactions with people* (2 ed., pp. 93-117). Cambridge University Press. <https://doi.org/10.1017/9781139161800.006>
- Serpell, J. A., & Duffy, D. L. (2016). Aspects of juvenile and adolescent environment predict aggression and fear in 12-month-old guide dogs. *Frontiers in Veterinary Science*, 3, 49. <https://doi.org/10.3389/fvets.2016.00049>
- Takeuchi, Y., Hashizume, C., Arata, S., Inoue-Murayama, M., Maki, T., Hart, B. L., & Mori, Y. (2009). An approach to canine behavioural genetics employing guide dogs for the blind. *Animal Genetics*, 40(2), 217-224. <https://doi.org/10.1111/j.1365-2052.2008.01823.x>
- Thomson, S. B. (2010). Sample size and grounded theory. *Journal of Administration and Governance*, 5(1), 45-52. <https://ssrn.com/abstract=3037218>
- Todd, Z. (2018). Barriers to the adoption of humane dog training methods. *Journal of Veterinary Behavior*, 25, 28-34. <https://doi.org/10.1016/j.jveb.2018.03.004>
- Tomkins, L. M., Thomson, P. C., & McGreevy, P. D. (2011). Behavioral and physiological predictors of guide dog success. *Journal of Veterinary Behavior*, 6(3), 178-187. <https://doi.org/10.1016/j.jveb.2010.12.002>
- Toomey, E., Matvienko-Sikar, K., Doherty, E., Harrington, J., Hayes, C. B., Heary, C., Hennessy, M., Kelly, C., McHugh, S., McSharry, J., O'Halloran, J., Queally, M., Heffernan, T., Kearney, P. M., & Byrne, M. (2020). A collaborative approach to developing sustainable behaviour change interventions for childhood obesity prevention: Development of the Choosing Healthy Eating for Infant Health (CHERISH) intervention and implementation strategy. *British Journal of Health Psychology*, 25(2), 275-304. <https://doi.org/10.1111/bjhp.12407>

- Vaterlaws-Whiteside, H., & Hartmann, A. (2017). Improving puppy behavior using a new standardized socialization program. *Applied Animal Behaviour Science*, 197, 55-61.
<https://doi.org/10.1016/j.applanim.2017.08.003>
- Von Bertalanffy, L. (1968). *General system theory: Foundations, development, applications*. George Braziller, Inc.
- Wirth, K. E., & Rein, D. B. (2008). The economic costs and benefits of dog guides for the blind. *Ophthalmic Epidemiology*, 15(2), 92-98.
<https://doi.org/10.1080/09286580801939353>
- Woolpy, J. H., & Ginsburg, B. E. (1967). Wolf socialization: a study of temperament in a wild social species. *American Zoologist*, 7(2), 357-363.
<https://www.jstor.org/stable/3881440>

Appendix

Paper 3 – Online Survey Questionnaire

Puppy Raiser Demographics (10)

1. In what year were you born?
2. What is your gender?
 - a. Male
 - b. Female
 - c. Non-binary
 - d. Prefer not to say
3. Number of assistance dog puppies you have raised *prior to the current one*.
4. Other than puppy raising, on average, how many hours each week do you engage in paid or voluntary work or study?
 - a. 0
 - b. 1-5
 - c. 6-10
 - d. 11-20
 - e. 21-30
 - f. 31-40
 - g. 41-50
 - h. More than 50
5. Country of residence
 - a. Australia
 - b. Canada
 - c. New Zealand
 - d. United Kingdom
 - e. United States
 - f. Other (please write) _____
6. Which of the following best describes the area in which your home is located?
 - a. Urban (Inner city)
 - b. Suburban (over 10km from city)
 - c. Regional city (population 50,000 or more)
 - d. Country town/Island (population less than 50,000)
 - e. Rural (not in a town or city)
7. What kind of dwelling is your home?
 - a. House
 - b. Semi-detached, terrace house, townhouse
 - c. Flat, unit, apartment
 - d. Other (*specify*)

8. Does this dwelling include the following?
 - a. Large outside space (farm, acreage)
 - b. Medium outside space (large house yard, small acreage)
 - c. Small outside space (small yard, patio, balcony)
 - d. No outside space
9. Specify the members in your household
 - a. Number of children under 2 years
 - b. Number of children (2-12 years)
 - c. Number of adolescents (13-17 years)
 - d. Number of adults (18 years and older) other than you
 - e. Number of dogs other than your trainee puppy
 - f. Number of other pets
10. What is the highest level of education you have completed?
 - a. No formal schooling
 - b. Year 10 or below
 - c. Year 11 or year 12
 - d. TAFE diploma, trade certificate, apprenticeship
 - e. University (undergraduate)
 - f. University (postgraduate)
 - g. Other (*specify*) _____

Puppy Raiser Personality – Big Five Inventory (BFI-10)

Instruction: How well do the following statements describe your personality?					
I see myself as someone who ...	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
... is reserved	1	2	3	4	5
... is generally trusting	1	2	3	4	5
... tends to be lazy	1	2	3	4	5
... is relaxed, handles stress well	1	2	3	4	5
... has few artistic interests	1	2	3	4	5
... is outgoing, sociable	1	2	3	4	5
... tends to find fault with others	1	2	3	4	5
... does a thorough job	1	2	3	4	5
... gets nervous easily	1	2	3	4	5
... has an active imagination	1	2	3	4	5

Puppy's details (7)

1. How old (in weeks) is your puppy? (please write a whole numeral) _____
2. How old (in weeks) was your puppy when you received him or her? (please write a whole numeral) _____
3. What breed or breed type best describes your puppy?
 - a. Golden Retriever (purebred or crossbred)
 - b. Labrador Retriever (purebred or crossbred)
 - c. German Shepherd (purebred or crossbred)
 - d. Poodle (purebred or crossbred)
 - e. Border Collie (purebred or crossbred)
 - f. Great Dane (purebred or crossbred)
 - g. Other (*specify*) _____

4. What is the colour of your puppy?

Golden Retriever	Labrador Retriever	German Shepherd	Poodle	Border Collie	Great Dane	Other
Dark golden Light golden Cream Golden Other	Black White Chocolate Other	Black Grey Sable Black and tan Blue Red and Black Black and silver Brown other	White Cream Apricot Red Brown Silver Black Other	Black and white Black tricolour Blue merle Blue tricolour merle Chocolate and white Other	Black White Brindle Fawn Blue Mantle Harlequin Merle Other	specify

5. What is the sex of your puppy?

- a. Male – not desexed/neutered/castrated
- b. Male – desexed/neutered/castrated
- c. Female – not desexed/spayed
- d. Female – desexed/spayed

6. Where did your organisation get your puppy from?

- a. Their own in-house breeding program
- b. An external breeder
- c. Shelter or rescue organisation
- d. Other (specify) _____
- e. Don't know

7. Intended assistance role for your puppy

- a. An assistance role but not yet specified
- b. A specific assistance role
 - Guide dog
 - Hearing dog
 - Mobility dog
 - Medical alert dog (e.g. diabetes, seizure alert)
 - Allergy detection dog
 - Medical response dog (e.g. diabetes, seizure response)
 - Autism assistance dog or other developmental disorder
 - Psychiatric assistance dog (e.g. post-traumatic stress disorder, depression, anxiety)
 - Dementia assistance dog
 - Other (specify) _____

Puppy training supervisor questionnaire (PTSQ - 35; Harvey et al., 2017)

Please rate how relevant each of the following statements is to your puppy.

Participants to rate on a visual analogue scale:

Items without (*) -- *never* to *almost always*

Items with (*) -- *Really does not describe this dog* to *Really describes this dog*

1. Attention can be attracted easily but it loses interest soon
2. Attention can be easily distracted
3. Is stubborn *
4. Seems not to listen even if it knows someone is speaking to it
5. Refuses to obey commands, which in the past it has proven it has learned
6. Needs obedience commands repeating to get a response
7. Is attentive to you
8. Shows a rapid response to correction by handling
9. Is easy to control *
10. Is eager to please *
11. Is friendly *
12. Stays/waits when instructed to
13. Responds immediately to the recall command when off lead
14. Is obviously startled by loud or unexpected sounds
15. Is obviously startled by odd or unexpected things or objects
16. Is anxious or uneasy in new situations
17. Backs away from or is reluctant to pass objects on the street (such as collecting boxes, bin bags or children's ride-on toys)
18. Adapts well to new situations and environments
19. Recovers quickly after being unsettled or frightened
20. Exhibits a high degree of excitement (jumps up; barks; coughs etc.) when goes somewhere new
21. Exhibits a high degree of excitement (jumps up; barks; coughs etc.) when you initially enter the home
22. Is active and energetic *
23. Is mischievous *
24. Is calm and quiet *
25. Is initially excitable (jumps up; barks; coughs etc.), but quickly settles
26. Is uneasy with being physically handled/groomed
27. Appears uneasy or uncomfortable when putting on **Assistance dog** equipment (including collars)
28. Is reluctant to walk close to the handler
29. Pulls (including lunging) towards unfamiliar dogs
30. Pulls towards/distracted by food on the ground or food scents
31. Shows interest (attempts to greet, sniffs, wags tail) when passing children or members of the public
32. Shows interest (attempts to greet, sniffs, wags tail) when it encounters other dogs
33. Attempts to sniff objects in the street
34. Appears uneasy on closed stairs
35. Appears uneasy on open or unusual (e.g. glass) stairs

Raisers' prediction of puppy raising outcomes (1)

In your opinion, how well suited is your puppy for his or her intended role?

Scale item from 0-10

0 = s/he is not at all suited for the intended role

10 = s/he is perfectly suited for the intended role

Puppy raising support scale (18)

As a puppy raiser, how much support do you receive from the following?	No support	A little support	A fair amount of support	Much support	A great deal of support
Support from the assistance dog organisation					
Overall support from your organisation	0	1	2	3	4
Dog trainers from your organisation	0	1	2	3	4
Puppy counsellors/mentors from your organisation (Mentors are not trainers, but are experienced in puppy raising and assigned by the organisation to help with your puppy raising)	0	1	2	3	4
Veterinarian from your organisation	0	1	2	3	4
Other puppy raisers from the organisation (in person and/or on an online platform, e.g. Facebook groups/pages, WhatsApp etc.)	0	1	2	3	4
Puppy sitters from your organisation (People assigned by the organisation to take care of your puppy while you are away or not able to care for your puppy for a while)	0	1	2	3	4
Training materials (manual, newsletter, video) from your organisation	0	1	2	3	4
Other support from your organisation (specify) _____	0	1	2	3	4
Support from outside the organisation					
Overall support from outside the organisation	0	1	2	3	4
Your own veterinarian	0	1	2	3	4
Dog trainers or professionals not from the organisation	0	1	2	3	4
Family members	0	1	2	3	4
Friends	0	1	2	3	4
General community	0	1	2	3	4
Co-workers	0	1	2	3	4
Books, videos, websites other than what the organisation provides	0	1	2	3	4
Social media (Facebook group/page etc., not affiliated with the organisation)	0	1	2	3	4

Other (specify) _____	0	1	2	3	4
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Puppy Raising Experience Scale (16)

How much do you agree or disagree with each of the following statements	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I put enough time into my puppy's socialisation	1	2	3	4	5
I put enough time into training my puppy with basic obedience skills	1	2	3	4	5
I put enough time into addressing my puppy's undesirable behaviours	1	2	3	4	5
I take my puppy to many different public places e.g. shopping centres, cafes, events.	1	2	3	4	5
I walk my puppy regularly, even when I don't feel like it	1	2	3	4	5
I ensure that my puppy is only exposed to new experiences in a safe and positive way	1	2	3	4	5
I introduce my puppy to people with different appearances and of different ages	1	2	3	4	5
I am always consistent with commands when training my puppy	1	2	3	4	5
I never give in to my puppy when s/he does what s/he is not allowed to	1	2	3	4	5
I am doing a good job of training my puppy	1	2	3	4	5
I know why my puppy behaves the way s/he does	1	2	3	4	5
I know what to do when my puppy doesn't behave	1	2	3	4	5
I work with organisation staff to improve my puppy raising	1	2	3	4	5
I enjoy helping other puppy raisers	1	2	3	4	5
I don't hesitate to reach out for help	1	2	3	4	5
I know when I should ask for help	1	2	3	4	5

Puppy raising practice index (1)

	Very poor	Quite poor	Not poor and not good	Quite good	Very good
Overall, how good a job do you believe you are doing as a puppy raiser?	1	2	3	4	5

Puppy raiser's affiliation (1)

Please provide the name of your puppy raising program provider (optional):